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ABSTRACT

The general purpose of the occupational analysis is to provide workable, basic information dealing with the many and varied duties performed in the landscape services occupation. Depending on the preparation and abilities of the individual student, he may enter the landscape area as (1) nursery worker, (2) landscape planter, (3) landscape maintenance worker, or (4) as a landscape designer or consultant. The document opens with a brief introduction followed by a job description. The bulk of the document is presented in table form. Twenty-three duties are broken down into a number of tasks and for each task a table is presented, showing: tools, equipment, materials, objects acted upon; performance knowledge; safety--hazard; science; math--number systems; and communications. The duties include: mowing, renovating and establishing lawns; fertilizing, pruning, watering and mulching landscape plants; edging landscape beds; removing leaves, preventing winter damage, and controlling disease, weeds, and insects in landscape plantings; maintaining small engines, equipment, and hand tools; balling and burlapping trees and shrubs; wrapping, guying, and staking trees; caring for wounds on woody plant materials; preparing a planting bed; applying fertilizer and lime; and planting hedges, screens, ground covers, and trees. (BP)

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Occupational Analysis

CE 004 182

LANDSCAPE SERVICES

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Instructional Materials Laboratory
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5232

AN ANALYSIS OF THE LANDSCAPING OCCUPATION

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FOREWORD

The occupational analysis project was conducted by The Instructional Materials Laboratory, Trade and Industrial Education, The Ohio State University in conjunction with the State Department of Education, Division of Vocational Education pursuant to a grant from the U.S. Office of Education.

The Occupational Analysis project was proposed and conducted to train vocational educators in the techniques of making a comprehensive occupational analysis. Instructors were selected from Agriculture, Business, Distributive, Home Economics, and Trade and Industrial Education to gain experience in developing analysis documents for sixty-one different occupations. Representatives from Business, Industry, Medicine, and Education were involved with the vocational instructors in conducting the analysis process.

The project was conducted in three phases. Phase one involved the planning and development of the project strategies. The analysis process was based on sound principles of learning and behavior. Phase two was the identification, selection and orientation of all participants. The training and workshop sessions constituted the third phase. Two-week workshops were held during which teams of vocational instructors conducted an analysis of the occupations in which they had employment experience. The instructors were assisted by both occupational consultants and subject matter specialists.

The project resulted in producing one hundred two trained vocational instructors capable of condulting and assisting in a comprehensive analysis of various occupations. Occupational analysis data were generated for sixty-one occupations. The analysis inlcuded a statement of the various tasks performed in each occupation. For each task the following items were identified: tools and equipment; procedural knowledge; safety knowledge; concepts and skills of mathematics, science and communication needed for successful performance in the occupation. The analysis data provided a basis for generating instructional materials, course outlines, student performance objectives, criterion measures, as well as identifying specific supporting skills and knowledge in the academic subject areas.

PREFACE

This material, attempts to analyze the entire field of landscaping. The writer determined that the field consists of four areas into which vocational students should be prepared to enter. Depending on the preparation or abilities of the individual student, he/she may enter the landscape areas as (1) a nursery worker, (2) as a landscape planter, (3) a landscape maintenance worker or (4) as a landscape designer and consultant. The areas are listed in sequence of complexity. Each area needs the knowledge and some of the skills of the preceding area; thus the area of landscape designer and consultant demands the most knowledge, ability and skills. Due to the various areas within the field, this analysis contains a relatively large number of duties and tasks. Some duties are duplicated however each duty has a different approach (task analysis) depending on the landscape area for which it has the most application.

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JOB DESCRIPTION

A landscape worker may fulfill any one or any combination of four roles. However, the landscape field can basically be divided into the areas which are listed below.

1 He/she may perform work in nursery which provides plants and availability of plants for planting in landscapes.

2 He/she may perform work on residential and commercial sites including delivery of plant materials, planting, staking, fertilizing, edging and bedding techniques, mulching and construction of landscape structures.

3 He/she may perform maintenance on established plantings. This work involves value judgment; performance of mowing, pruning, watering, edging, mulching, and some sales ability.

4 He/she may perform design work including drafting, using plant materials, reading blueprints, customer relations, scheduling and supervision of crews.

Duty A Mowing Lawns

1 Check oil and gasoline levels
2 Sharpen blades and reels of mowers
3 Adjust height of cutting
4 Cut grass with mowers
5 Remove grass clippings
6 Trim grass with hand tools
7 Clean lawn areas
8 Clean mowing equipment

(TASK STATEMENT) CHECK OIL AND GASOLINE LEVELS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Oil Gasoline, gasoline can, funnel Lawn mower Operator's manual Job assignment sheet	Locate oil and gasoline storage on mower Use can and funnel to fill to correct fluid level	No smoking around flammable liquids Avoid inhaling or ingesting gasoline Gasoline should not be placed into a hot or running machine Explosions
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Work input, work output, friction and efficiency in simple machines [Oil weight must be used to provide proper lubrication of engine parts] Simple machines used to gain mechanical advantage [Use of funnel (wedge)] Effect of heating and cooling on expansion of materials [Heat transfer from engine to gasoline] Indestructibility of energy and matter [Gasoline may burn producing heat energy]	Liquid and dry measures [Liquid measure—gallons needed for tank] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring in other than linear, square, and cubic) [Amount of gasoline or oil needed to fill without overflowing]	Read: Operator's manual upon initial experience to determine correct procedures Write: Time job began on job assignment sheet

(TASK STATEMENT) SHARPEN BLADES AND REELS OF MOWERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rotary type mower Reel type mower File Grinder, balancer Vice Safety glasses	Examine condition of grass ends after cutting lawn Examine edge of cutting blade Disconnect sparkplug Use file - sharpen blade properly	Avoid cutting hands on sharpened blades Spark plug should be disconnected before blade is removed or sharpened
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Mower blades and reels must be sharp to provide clean shearing of grass blades]		

(TASK STATEMENT) ADJUST HEIGHT OF CUTTING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rotary type mower Reel type mower Wrenches Measuring device Level surface Recommended cutting height of various grasses	Identify grass varieties, knowledge of conditions of wear and maintenance on area to be mowed Consider current and expected weather conditions Determine difference between measured setting and actual cutting height	Choose proper size and type of wrench to avoid injury to hands Avoid adjusting mower with spark plug cable connected Cutting hands on moving blade
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Principle: Cutting height is important to health of grass Concepts: Too short a cut leaves too little photosynthesis area too long a cut promotes disease Principle: improper cutting height affect appearance of grass. Concept: Cut too short–brown appearance Cut too long–shaggy, uneven appearance Removing more than ½ inch –thatch build-up	Linear measure [Make bench setting on mower]	Read: Cutting height recommendations

(TASK STATEMENT) CUT GRASS WITH MOWERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Unmowed lawn Rotary type hand mower Reel type hand mower Lawn tractor mounted mower P.T.O. mounted mower Customer work order	Start and operate various mower systems Select mower system to fit the job Determine direction for mowing - very subsequent direction in one area to prevent grain Select appropriate conditions (weather, ground and grass) under which mowing should occur Avoid throwing clippings into planting beds	Wear leather shoes preferably with steel toes and with non-skid sole Do not mow wet, damp (slippery) lawns Wear protective clothes to prevent sunburn, protect from flying objects Avoid mowing over objects which can be propelled or which dull blades Teach tractor safety if tractor/mounted mower is used Remove other people from area to be mowed
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Cutting grass provides neat appearance, helps control weeds, promotes health of grass and control of diseases, and provides play area Clippings should not be thrown into planting beds as the seeds will germinate and cause weed problems Centrifugal forces developed by bodies in rotation [Rotating blades produce centrifugal force which may cause projection of foreign object]		Read: Work order from customer

(TASK STATEMENT) REMOVE GRASS CLIPPINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Grass catcher, mower Lawn sweeper Rakes Leaf bags Customer work order	Determine when clippings should be removed Select method of removal to be used Containerize clippings for removal or composing if requested by customer	Wear protective clothing including gloves to prevent blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Removal of clippings is needed when more than ½" of grass is cut off to prevent thatch Clippings should usually be removed from areas of the lawn where grass is thick and left on ground in areas where grass is thin If clippings are not removed extra nitrogen fertilizer is required to rot clippings		Read: Work order of customer

(TASK STATEMENT) TRIM GRASS WITH HAND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Grass shears Electric hand trimmers Hand sickle Weed whip Power edger	Determine trimming to be done by hand and select method to be used Determine correct method of use of each hand tool	Wear protective clothes Cut hands Use sharp tools Cuts Avoid injury to people in close proximity to trimming area Turn off electric tools when not in use and use grounded plugs Use proper tool for job

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS

(TASK STATEMENT) CLEAN LAWN AREAS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Brooms Water Hoses Leaf bags Lawn sweeper	Clear walks, driveways, patios of grass clippings Brush grass clippings off house foundation walls, walls, etc. Edge grass along walks, drives, planting beds	Wear protective clothing Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Leaving area clean sets off newly mown appearance of lawn Removing clippings from paved areas prevents being tracked into the home		Write: Sign and date work order when job is complete

(TASK STATEMENT) CLEAN MOWING EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Lawn mower Scraping tool Hose Wire brush Job assignment sheet Wrench	Select method needed to insure clean conditions of equipment and insure good operating condition Perform preventive maintenance as needed - tightening bolts	Protective clothing, safety glasses Sparks in eyes, cuts and bruises on hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment helps maintain operational condition Require crew to clean tools helps instill a sense of pride in doing a good, neat job overall Clean equipment helps present a favorable image to customers	Counting–inventory tools to make sure all tools are retrieved from landscape area Measure of time and speed (Example: time - seconds, minutes, etc., speed - feet per minute, R.P.M., etc.) [Time required to do job]	Write: Time when job is finished on assignment sheet

Duty B Fertilizing Landscape Plants

1 Take soil samples
2 Make soil tests
3 Take a plant tissue sample
4 Measure area to be treated
5 Calibrate applicator
6 Apply fertilizer
7 Clean equipment

(TASK STATEMENT) TAKE SOIL SAMPLES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY HAZARD
Plastic pail Trowel or spade Soil probe or auger Pencil and paper	Determine where soil test should be conducted Sample by random method Use clean equipment to insure uncontaminated sample Determine depth of soil to use for sample Mix and dry sample on uncontaminated surface, protect from additional contamination and perform at proper temperature	Wear gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fertility of soil must be known before applying fertilizer so that correct amounts of the proper analysis can be applied to aid growth of specific plant Random soil samples tested will give best estimate of existing fertility	Linear measure–depth of soil to be collected Counting– sequential numbering of samples	Read Customer work order Write Label samples to avoid confusion when multiple samples are taken

(TASK STATEMENT) MAKE SOIL TESTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Soil test kit University Soil Testing Service kit or Independent Service kit Mixing equipment Pencil Paper	Select a representative sample from the gross collectad sample Prevent contaminated of soil Note results with tests and use kit charts to interpret Determine services provided by soil testing laboratories and interpret results and recommendations	Respirator–avoid inhaling toxic fumes Wear rubber gloves and apron Avoid contact of toxic materials with skin
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Soil tests allow development of recommendations for fertilizer applications Most state universities offer soil testing services for a minimum charge Private labs also provide soil testing services for a fee	Liquid and dry measure [Liquid measure–measuring outlasting solutions] [Dry measure–measuring out volumes of soil]	Read: Directions with soil test kit or on card of lab soil test kit Results and recommendations of tests

(TASK STATEMENT) TAKE A PLANT TISSUE SAMPLE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Plastic bags Stapler, labeling tags Tissue testing kit University Tissue Testing Service kit Pencil Paper	Select part of plant from which tissue sample should be taken Handle tissue sample to prevent contamination	Protective clothing Sunburn prevention
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant tissue samples yield further knowledge about the nutrition of the plant Various elements tend to collect in specific parts of the plant Avoid contact of sample with paper which contains potassium	Counting–sequential numbering of samples	Read: Directions on self-service kit or lab kit Write: Label samples to avoid confusion

(TASK STATEMENT) MEASURE AREA TO BE TREATED

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
100-foot tape Two stakes Pencil, paper Measuring wheel Customer work order	Select measuring device needed to complete the job Use measuring device so that entire area is included Calculate the number of the workers steps equal to 100 feet	Protective clothes Sunburn
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers [Figure square footage] Changing percents to fractions and fractions to percents [Knowledge of linear systems of measurement–length, width]	Read: Customer work order to determine what areas are to be treated Draw: A rough sketch if necessary

(TASK STATEMENT) CALIBRATE APPLICATOR

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Fertilizer spreaders Cyclone type Scott Spreader Ross Root Feeder Fertilizer 50' by 8' sheet of polyethylene Scale Broom Pencil, paper Container Fertilizer recommendations	Select method of calibrating each type of applicator Identify component to be measured Collect fertilizer spread on standard area, and weigh fertilizer	Protective clothes Fertilizer burn Respirator Inhaling dust
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Centrifugal forces developed by bodies in rotation [Calibration of spreader is important for each type of material due to differences in particle size]	Ratio and proportion [Ratio– calculation of amount of fertilizer] [Proportion– applied per 1000 ft.^{2} or per acre] Measures of weight [Use of scale] Measures of length [Linear measure–figure square footage] Liquid and dry measures [Volume–amount to place in spreader] Addition and subtraction of whole numbers [Adding volumes to obtain total volume] Multiplication and division with whole numbers [Cross multiplying]	Read: Fertilizer labels Fertilizer recommendations

(TASK STATEMENT) APPLY FERTILIZER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Fertilizer Spreaders Paved area Grassed area Broom Container	Recognize spreading pattern and degree of overlap to avoid Reduce application rate in half and fertilize same area in two directions Fill spreader on paved area–preventing spillage and burning on lawn areas	Protective clothing Burning of skin or eyes Use equipment which is properly maintained Injury to hands from unpadded handles
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fertilizing increases nutrient level in soil and aids growth of plants	Liquid and dry measures [Volume–amount to place in applicator]	Read: Calibration chart developed for spreader for specific material to be applied

(TASK STATEMENT) CLEAN EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water Hoses Brushes Oil Adjustable wrench Foreman's worksheet	Select proper method of cleaning each tool to prevent rust, and maintain operating condition[Clean tools and equipment	Select correct size and type of wrench Injury to hand and damage to nuts and bolts
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment helps maintain operating condition, presents a favorable image to customer, and helps instill pride in quality of work by crew Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt; oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Sizes of nuts and corresponding wrench needed for job Counting—inventorying equipment to make certain no tools left on job site Measure of time and speed [Time required for job]	

Duty C — Pruning Landscape Plants

1	Sharpen pruning tools
2	Prune large trees
3	Prune deciduous shrubs
4	Prune narrow-leafed evergreens
5	Prune broadleaf evergreens
6	Prune vines
7	Prune ground covers
8	Prune hedges
9	Clean pruning equipment
10	Clean landscape area
11	Identify landscape plants (classifications)

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(TASK STATEMENT) SHARPEN PRUNING TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Chain saw Hedge shears Pruning saws Pole pruners Hopping shears Files Hand pruners File guide	Select tools requiring sharpening Select method to be used to sharpen each tool Perform sharpening task safely	Wearing protective clothing and safety glasses Cutting hands on sharpened tools
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Sharp tools decrease physical effort needed to complete pruning tasks] Relationship of force to distortion in an elastic body [Sharp tools leave a clean edge which promotes easier healing]		

(TASK STATEMENT) PRUNE LARGE TREES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Chain saws Pruning saws Pole pruners Ropes and saddles Wound compound Mallet, chisel Work order from customer	Select part of plant to remove Use correct pruning techniques including cutting and treating of wound Use ropes and tree saddles for climbing trees Select correct time to prune	Use safety lines Falls Wear proper shoes and protective clothing Cuts, splinters Watch for people beneath work area Dropping limbs on people Use properly maintained tools injury to hands Use correct tool for size of cut Breakage if tool is worked beyond capacity Turn off chain saw when not in use Massive wounds to operator
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Proper pruning techniques]		Read: Work order from customer to determine what tree is to be pruned

(TASK STATEMENT) PRUNE DECIDUOUS SHRUBS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hand pruners Hoppers Customer work order Spray wound compound	Select parts of plant to remove. Diseased parts, dead parts Broken limbs Crossovers Select time of uear to: Prune - (flowering shrubs; immediately after flowering) Use correct pruning procedures	Gloves Blisters Use correct tool for size of cut–Rbughly equal to size of tool Do not use tools with broken handles or dull blades Splinters, wounds
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Correct pruning techniques]		Read: Customer work order to determine what shrubs are to be pruned

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(TASK STATEMENT) PRUNE NARROW-LEAFED EVERGREENS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hedge shears Hand pruners Hoppers Pruning saws Customer work order	Use shearing or pruning technique as dictated by previous methods of handling plant Use correct shearing or pruning techniques Apply wound compound on all wounds larger than one inch Determine which limbs to remove, and time to prune	Gloves Blisters, splinters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Correct pruning techniques]		Read: Work order written by customer

(TASK STATEMENT) PRUNE BROADLEAF EVERGREENS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Loppers Shears Hand pruners Wound compound Customer work order	Use proper pruning techniques and proper tool for job Adhere to shearing technique in holly if it has been previously used Choose proper time of year to prune Apply wound dressing to wounds over one-inch diameter	Gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Correct pruning techniques]		Read: Customer work order

(TASK STATEMENT) PRUNE VINES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Loppers Hand pruners Customer work order	Identify vines and types of vines Identify diseased parts Remove dead, diseased, broken branches, training vines	Gloves needed Blisters, splinters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage, Work input, work output, fricition and efficiency in simple machines [Correct pruning techniques]		Read: Customer work order

(TASK STATEMENT) PRUNE GROUND COVERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hedge shears Hand pruners Customer work order	Identify ground cover Identify disease Select correct pruning technique	Gloves needed
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage, Work input, work output, friction and efficiency in simple machines [Correct pruning techniques]		Read: Customer work order

(TASK STATEMENT) PRUNE HEDGES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hand hedge shears Electric hedge sheers Customer order	Identify hedge plants Use correct shearing techniques and shape hedge to form best design to admit sunlight to entire hedge Determine time of year to shear and how much material can and/or should be removed	Turn off electric equipment when not in use Wounds to operator Do not wear loose clothing May be caught in moving blades of trimmers
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage, Work input, work output, friction and efficiency in simple machines [Correct pruning techniques]		Read: Customer work order

(TASK STATEMENT) CLEAN PRUNING EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water, detergent Scraping tool Oil	Select proper method of cleaning to maintain working condition of tools Oil tools to prevent rusting and lubricate moving parts	Gloves Cutting hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment presents favorable image to customer Cleaning tools helps maintain operational condition Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting		Write: Time used to complete pruning job

(TASK STATEMENT) CLEAN LANDSCAPE AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rakes Forks Trucks, ropes, red flags Leaf bags Chipper, operator's manual Customer work order	Remove all pruned material from lawn areas Chip and compost trimmings; use as mulch Bag and remove small trimmings	Gloves Splinters, blisters Safety glasses for use with chipper, also hard hat and other protective clothing Make certain prunings are seamed to truck with ropes and limbs extending out of truck are marked with red flags Prevent dropping limbs on roads Do not chip larger diameter wood than chipper is capable of handling
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Removing prunings promotes health of plants, helps prevent fungus diseases and presents neat appearance		Read: Operator's manual for chipper Customer work order

(TASK STATEMENT) IDENTIFY LANDSCAPE PLANTS (CLASSIFICATIONS)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Large trees Deciduous shrubs Narrow-leaf evergreens Broad-leaf evergreens Vines Ground covers Hedge plants Annuals, perennials Pencil, paper Tags, nursery marking equipment	Identify plant parts Observe growth habits of plants Distinguish among leaf types	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant taxonomy–classification and naming of plants		Write: Names and description of plants

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Duty D Watering Various Types of Landscape Plants

1 Apply water to turf
2 Apply water to shrubs and trees
3 Apply water to annuals, perennials, and ground covers
4 Clean equipment

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(TASK STATEMENT) APPLY WATER TO TURF

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hoses Sprinklers Fan type Walking Underground irrigation system with pop-up sprinklers Tensiometer Calibrated container	Select proper equipment to use for job Set up and operate each type of equipment Observe conditions that indicate that irrigation is needed Use tensiometer Estimate correct amount of water to use	Protective clothing—rubber clothing Wet feet, colds, etc.
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (measuring in other than linear, square, and cubic) [Tensiometer scale] Liquid and dry measure [Liquid measure—reading calibrated container to estimate volume of water applied]	Read: Tensiometer

(TASK STATEMENT) APPLY WATER TO SHRUBS AND TREES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hoses Breakers Ross Root Feeder	Use Ross Root Feeder to irrigate at deep root level Estimate time required for adequate pentration of water into soil considering soil structure	Gloves Protective clothing
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Measures of time and speed [Time and speed of penetration of water into soil]	Read: Operating directions for Ross Root Feeder

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(TASK STATEMENT) APPLY WATER TO ANNUALS, PERENNIALS, AND GROUND COVERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hoses Breakers	Estimate water need by feeling soil at root depth and by observation of plant condition Estimate correct amount to apply and frequency of application	Rubber boots Wet and muddy feet
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Measures of time and speed [Time and speed of penetration of water into soil]	

(TASK STATEMENT) CLEAN EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hoses Sprinklers Breakers Oil	Drain water from hoses and sprinklers Dry parts to prevent rusting and oil moving parts	Avoid leaving water on floors Slipping, falls

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Clean equipment helps maintain operating condition, presents a favorable image to customer, and helps instill pride in quality of work by crew Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt; oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Record time required to complete job

Duty E Mulching Landscape Plants

1 Measure area to be mulched
2 Apply mulches
3 Clean equipment
4 Clean landscape area

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(TASK STATEMENT) MEASURE AREA TO BE MULCHED

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
50' measuring tape Pencil, paper Measuring wheel 3/4" by 12' steel tape Customer work request Mulch to be used	Use measuring wheel, steel tape, knowledge of number of workers steps in 100 feet Select proper measuring method Figure square footage Determine thickness of mulch required	Avoid sharp edge of steel tape Cut on hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Awareness of linear measurements–square footage Adding–measurements accumulated Multiplication and division with whole numbers [Multiplication–square footage] [Division–figuring coverage of mulch]	Read: Customer work request Mulch bag to determine coverage Draw: Rough sketch if necessary

(TASK STATEMENT) APPLY MULCHES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Bark mulch Black plastic mulch Marble chip mulch Rakes Shovels Wheelbarrow Knives Customer work requests	Overlap black plastic underlayment and anchor Apply depth of mulch required Remove thick mulch from the truck base of shrubs	Use legs not back when lifting heavy loads Use care with knife Gloves
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Purposes of mulching Weed control Moisture retention Appearance Erosion control	Linear measurement Determine thickness of mulch application	Read: Customer work requests

(TASK STATEMENT) CLEAN EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rakes Shovels Wheelbarrows Hoses Oil Cloth	Clean equipment with method insuring continued operational condition Oil moving parts	Protective clothing Blisters

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Clean equipment helps maintain operating condition, presents a favorable image to customer, and helps instill pride in quality of work by crew Fluids under pressue [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt; oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Tag all broken equipment for repair at later date

(TASK STATEMENT) CLEAN LANDSCAPE AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Broom Rake Shovel Wheelbarrow Trash bags Foreman's work assignment sheet	Clean all paved areas of debris Use stiff push broom, sweep grass close to mulched bed to remove soil and scattered mulch Clean and define edge of bed	Gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Cleaning reinforces changed and improved appearance wrought by mulching Removing mulch from paved areas prevents tracking into house	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Time needed to complete the entire job on work sheet

Duty F Edging of Landscape Beds

1 Maintain power edger
2 Edge beds
3 Clean landscape area

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(TASK STATEMENT) MAINTAIN POWER EDGER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Oil Gasoline File Adjustable wrench Operator's manual	Check gas and oil levels before each operation and fill as needed Sharpen cutting edges Check and tighten nuts regularly Lubricate moving parts as needed	Wear necessary protective equipment Injury to eyes Use appropriate type and size of head tools Hand injury

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Work input, work output, friction and efficiency in simple machines [Oil weight must be used to provide proper lubrication of engine parts] Simple machines used to gain mechanical advantage [Use of funnel (wedge)] Effect of heating and cooling on expansion of materials [Heat transfer from engine to gasoline] Indestructibility of energy and matter [Gasoline may burn producing heat energy] Work input, work output, friction and efficiency in simple machines; Simple machines used to gain mechanical advantage [Sharp edge reduces shearing force needed allowing decreased wear on machine]	Liquid and dry measures [Liquid measure—gallons needed for tank] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring in other than linear, square, and cubic) [Amount of gasoline or oil needed to fill without overflowing]	Write: Requesting edger be sent to shop for major repairs—write tag

(TASK STATEMENT) EDGE BEDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Chalk line, stakes Garden hose Half-moon edger Power edger Wheelbarrow Shovel Spade Rake Hoe Customer's work request	For geometric beds, lay out lines of bed with chalk line and stakes; for free form bed use flexible garden hose to lay out edge and mark further with spade Correct and safe use of various types of equipment and selection of proper equipment for the job Maintain clean and neat conditions as work progresses	Wear gloves Blisters Protective clothing needed Foot injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Read: Customer work request

(TASK STATEMENT) CLEAN LANDSCAPE AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rake Shovel Wheelbarrow Soil Foreman's work sheet	Shovel large debris from lawn and bed area Break up large clods and spread soil evenly on unmulched bed Firm soil Remove excess soil from bed and lawn and place on truck Use stiff push broom to sweep fine soil from grassed area Remove debris from paved areas	Gloves Blisters, splinters Well maintained tools Splinters and puncture wounds from broken handles
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Cleaning emphasizes neat appearance and improvement in landscape brought about by performing the edging operation	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Time taken to complete work on work sheet

Duty G Removing Leaves from Landscape Plantings

1 Identify type of tools needed for job
2 Use leaf rake
3 Use lawn sweeper
4 Use leaf blower

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(TASK STATEMENT) IDENTIFY TYPE OF TOOLS NEEDED FOR JOB

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Leaf rakes Lawn sweeper Leaf blower Leaf bags Lawn mower with catch bag Customer work request	Determine the function and capacity of each type leaf removal equipment Find area to be covered and select proper equipment	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Correct tool decreases amount of physical labor needed to remove leaves]		Read: Work sheet to determine approximate area of lawn to be treated

(TASK STATEMENT) USE LEAF RAKE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Leaf rakes Leaf bags Customer work request Foreman's work sheet	Use rake and maintain efficient raking technique Remove leaves from property or compost	Gloves Blisters Lay rake on ground with teeth down Puncture wounds Falls

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Rake speeds removal process]	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Read: Customer work request to determine if leaves are to be removed or composted Write: Time required for job on foreman's work sheet, also account for bulk of leaves removed

(TASK STATEMENT) USE LAWN SWEEPER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Lawn sweeper and trailer Truck, leaf bags Hand rake Customer work request Foreman's work sheet Lawn sweeper operations manual	Operate lawn sweeper Bag leaves or compost	Do not sweep leaves when grass is wet Falls Protective clothing–gloves Blisters If sweeper is electric use grounded cord–electric shock Read operator's manual before initial experience with lawn sweeper Damage to machine and operator
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Decrease physical labor by using lawn sweeper] Centrifugal forces developed by bodies in rotation [Rotating sweeper brush tends to discharge material] Resistance of materials to flow of electrical current [Electric shock from power sweeper] Effects of friction on work processes and product quality [Condition of rotating brush dictates ability to pick up leaves]	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Read: Customer work request to determine if leaves are to be composted Write: Time required for job on foreman's work sheet, also volume of leaves removed

(TASK STATEMENT) USE LEAF BLOWER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Leaf blower, operations manual Truck Customer work request	Operate leaf blower	Protective clothing Blisters Avoid foreign objects Injury from projectiles Read operator's manual before initial experience with leaf blower injury to machine and operator
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Work input, work output, friction and efficiency in simple machines [Friction against leaves by air caused suction of leaves into leaf bag] Inertia and momentum [Leaves remain on ground if suction of blower is too small]	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Read: Work request to determine if customer wants leaves composted Write: Time required to do job and record the volume of leaves removed

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Duty H Maintaining Small Engines and Equipment

1 Check oil levels and fuel levels
2 Clean air filters
3 Clean and adjust spark plugs
4 Adjust carburetor
5 Check battery electrolyte level
6 Check tire pressures
7 Lubricate equipment
8 Clean small engines and equipment
9 Store small engines and equipment

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(TASK STATEMENT) CHECK OIL LEVELS AND FUEL LEVELS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Small tractor Rototiller Gasoline, funnel, gasoline can Oil Operator's manuals	Read operator's manual before initial experience to determine proper levels and types of fuel and lubricants If levels are below that recommended, fill as needed Lubricate moving parts as needed Cue: Stalling—gas Overheating—oil Noisy operation—oil	Avoid inhaling or ingesting toxic fumes Poisoning operator Do not fill with gasoline when engine is hot or running Do not fill gasoline tank so that overflow occurs during use Explosions, fire Avoid oil spills Falls
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Work input, work output, friction and efficiency in simple machines [Oil weight must be used to provide proper lubrication of engine parts] Simple machines used to gain mechanical advantage [Use of funnel (wedge)] Effect of heating and cooling on expansion of materials [Heat transfer from engine to gasoline] Indestructibility of energy and matter [Gasoline may burn producing heat energy]	Liquid and dry measures [Liquid measure—gallons needed for tank] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measure in other than linear, square, and cubic) [Amount of gasoline or oil needed to fill without overflowing]	Read: Operator's manual prior to initial experience

(TASK STATEMENT) CLEAN AIR FILTERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Lawn mower Cub tractor Operator's manuals Water and detergent Solvent Compressed air Cloth	Select proper cleaning agent for the problem Select proper method of conducting cleaning operation Locate air filter, remove and install an air filter Cue: Excessive fuel consumption Overheating Hard starting	Avoid inhaling or ingesting toxic solvents Wear protective clothing Injury to hands and eyes Wear safety glasses Injury to hands and eyes
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Forces acting on a body immersed or floating in a liquid [Action of solvent on air cleaner] Effects of friction on work processes and product quality [Scrubbing as cleaning process]		Read: Operator's manual regarding cleaning of air filters

(TASK STATEMENT) CLEAN AND ADJUST SPARK PLUGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Lawn mower Cub tractor Spark plug wrench Spark plug gauge Ignition file or plug cleaner Operator's manual	Remove and install spark plugs Know importance of spark plugs to operation and decide when plugs need cleaned and/or adjusted Use spark plug, gauge, ignition file and plug cleaner Cue: Misfiring Hard starting	Wear protective clothing Scraping injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Use of wrench, file, plug cleaner]	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring in other than linear, square, and cubic) [Use of plug gauge]	Read: Operator's manual section on spark plugs

(TASK STATEMENT) ADJUST CARBURETOR

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Lawn mower Rototiller Operator's manuals Screwdriver	Know function of carburetor and importance of efficient operation and adjustment Adjust carburetor to manufacturer's specifications Cue: Poor performance at high speed Poor performance at low speed Hard starting Stalling	Protective clothing Grease on clothing
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Work input, work output, friction and efficiency in simple machine machines [Efficiency in machines involved affects efficiency of complex machines]	Measure with the Metric and English system and convert between them [Use of Metric tools]	Read: Operator's manual section on carburetors

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(TASK STATEMENT) CHECK BATTERY ELECTROLYTE LEVEL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Cub tractor Funnel Clean container Clean water Operator's manual	Remove battery well covers Decide if water should be added Add water Cue: Hard starting No start Excessive charge rate No charge rate	Wear protective clothing Acid burns
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements [Chemical reaction occurrive in battery involving transfer of energy from one form to another]	Liquid and dry measures [Liquid measure, amount of water to add]	Read: Operator's manual to determine proper levels

(TASK STATEMENT) CHECK TIRE PRESSURES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pressure gauge Pneumatic tired vehicle Operator's manual Compressed air	Determine suggested tire pressure Use tire gauge Use air hose to increase inflation Observe tires which may be lacking sufficient air pressure Cue: Hard steering or pulling right or left due to under-inflation Rough riding—over-inflation Tire wear—under or over-inflation	Do not overinflate tires Explosions
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Effect of heating and cooling on expansion of materials [Effect of temperature on tire pressure]	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) [Use of pressure gauge]	Read: Operator's manual Printing on tires Pressure gauge

(TASK STATEMENT) LUBRICATE EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Grease gun Oil can Cub tractor Lawn mower Rototiller Fertilizer spreader Operator's manuals	List places of locations on equipment which require periodical lubrication Select method and type of lubrication Apply lubrication Cue: Noisy operation Oxidation Wear Inoperative components	Avoid grease and oil being dropped on ground or floor Slips, falls Avoid loose clothing
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Work input, work output, friction and efficiency in simple machines [Proper oil weights provide correct lubricati on of engine parts] Simple machines used to gain mechanical advantage [Grease gun (lever)]		Read: Lubrication section in operator's manual

(TASK STATEMENT) CLEAN SMALL ENGINES AND EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wire brush Water hose Compressed air Cloths Scraping tool Operator's manuals	Select proper cleaning method Use water, compressed air, scraping tools to clean engines and equipment Cue: Overheating—engines Obvious to sight	Protect eyes and hands—gloves Cuts, scrapes
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Scraping tool]		Read: Cleaning section of operator's manuals prior to initial experience

(TASK STATEMENT) STORE SMALL ENGINES AND EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Gasoline tanks Oil reservoirs Oil, oil can Paint Grease, grease gun Tool board Tool cupboard Wrenches Operator's manual for power equipment	Familiarize self with operator's or owner's manual recommended procedure for storing each machine according to manufacturer and follow recommendations	Avoid smoking around flammable materials Fires Protective clothing Grease on clothing Oil spills on floors Falls
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Indestructibility of energy and matter [Gasoline produces heat and light energy in burning]		Read: Operator's manual

Duty I Renovating Lawns

1 Apply herbicides
2 Apply disease control measures
3 Apply insecticides
4 Thatch lawns
5 Aerate lawns
6 Apply soil and soil amendments to lawn

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(TASK STATEMENT) APPLY HERBICIDES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pre-emergence herbicide Post emergence herbicide Wettable powder herbicide Emulsifiable concentrate Weed Control Herbicide Recommendations Experimental turf plots Sprayers Pails Water Hoses Rubber gloves Respirator Scales, cylinder Pencil Paper Mixing tool Detergent	Select correct herbicide for problem Identify problem – Identify weeds and other plants in infested area Use measuring techniques Use correct mixing techniques Use correct application techniques Know value of weed control Maintain equipment Control drift of spray	Avoid breathing or ingesting fumes of herbicides—wear respirator Wear gloves and other protective clothing Check compatability charts when combining two or more herbicides Clean sprayers, containers, mixing equipment and measuring equipment thoroughly Bury empty containers Wash thoroughly when finished
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Sprayers] Work input, work output, friction and efficiency in simple machines [Sprayer pumps] Fluids under pressure [Herbicide solution in sprayer when air pressure has been increased]	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills to calculate amount of area to be covered, amount of herbicide to be used] Liquid and dry measures [Volume of liquid and powder herbicides] Measure with the Metric and English system and covert between them [Use of Metric cylinder if needed] Measure of time and speed [Time required to do job]	Read: Weed control recommendations Herbicide labels Write: Record time needed for job

(TASK STATEMENT) APPLY DISEASE CONTROL MEASURES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Fungicides Wettable powder Emulsifiable concentrate Fungus infestad lawns Pesticide recommendations Sprayers Duster Scales Cylinders Containers Water Mixing equipment Detergent Paper Pencil	Identify problem Select correct fungicides Use measuring techniques Use correct mixing techniques Use correct application techniques Know value of disease control Maintain and clean equipment	Avoid breathing or ingesting fumes of fungicides—wear respirator Wear gloves and other protective clothing Check compatability charts when combining two or more fungicides Clean sprayers, containers, mixing equipment and measuring equipment thoroughly Bury empty containers Wash thoroughly when finished
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Sprayers] Work input, work output, friction and efficiency in simple machines [Sprayer pumps] Fluids under pressure [Fungicide solution in sprayer when air pressure has been increased]	Addition and subtraction of whole number; Changing percents to fractions and fractions to percents [Basic arithmetic skills to calculate amount of area to be covered amount of fungicide to be used] Liquid and dry measures [Volume of liquid and powder fungicides] Measure with the Metric and English system and convert between them [Use of Metric cylinder if needed] Measure of time and speed [Time required to do job]	Read: Pesticide recommendations Pesticide labels Write: Record time needed for job

(TASK STATEMENT) APPLY INSECTICIDES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wettable powder insecticides Emulsifiable concentrate insecticides Sprayers Dusters Spreaders Organic insecticides Nicotine Milky Spore diseases Scales Cylinders Containers Paper Pencil Insecticide recommendations	Identify the problem Select correct insecticides Use measuring techniques Use correct mixing techniques Use correct application techniques Know value of disease control Maintain and clean equipment	Avoid breathing or ingesting fumes of insecticides–wear respirator Wear gloves and other protective clothing Check compatability charts when combining two or more insecticides Clean sprayers, containers, mixing equipment and measuring equipment thoroughly Bury empty containers Wash thoroughly when finished
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Sprayers] Work input, work output, friction and efficiency in simple machines [Sprayer pumps] Fluids under pressure [Insecticide solution in sprayer when air pressure has been increased]	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills to calculate amount of area to be covered, amount of insecticide to be used] Liquid and dry measures [Volume of liquid and powder insecticide] Measure with the Metric and English system and convert between them [Use of Metric cylinder if needed] Measure of time and speed [Time required to do job]	Read: Insecticide labels Insecticide recommendations Write: Record time needed for job

(TASK STATEMENT) THATCH LAWNS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Thatching machine Gasoline Oil Rakes Lawn sweeper Leaf bags Truck Lawn area Operator's manual Customer work request	Operate thatching machine Adjust depth of penetration Perform preliminary maintenance of machine Determine thatching patterns Identify situations where thatching is required Know importance of thatching – value Remove excess grass from thatched lawn	Use well maintained equipment Injury to operator Check gas and oil levels before used and fill machine with gasoline on, when engine is cold Explosions, fire Wear gloves and protective clothing Blisters, projectile objects
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage, Work input, work output, friction and efficiency in simple machines [Thatching machine is a combination of simple machines] Centrifugal forces developed by bodies in rotation [Thatching blades rotate to cut]	Measure of time and speed [Time required to do job]	Read: Operator's manual prior to initial experience Write: Record time required for job

(TASK STATEMENT) AERATE LAWNS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Aerifier Lawn rakes Wheelbarrow Shovels Gasoline Oil Lawn area Operating manual	Identify problem area needing aerating List causes of compaction Operate aerifier, and maintain machine Collect and displace of plugs removed from lawn	Use well maintained machine Injury to operator Check gasoline and oil levels before using and fill with gasoline only when engine is cold Explosion Wear protective clothing Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Aerifier a combination of simple machines] Centrifugal forces developed by bodies in rotation [Aerifier spoons rotate]	Measure of time and speed [Time required to do job]	Read: Operator's manual Write: Record time needed for job

(TASK STATEMENT) APPLY SOIL AND SOIL AMENDMENTS TO LAWN

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Top soil Tractor mounted landscaping rake, shovel Gypsum Spreader Weight to volume ratio of soil	Recognize situation when soil or soil amendment is needed Select solution to problem Select source of top soil and estimate amount needed Estimate quantity of amendments needed Use tractor to apply and spread soil Use hand spreader to apply gypsum Calibrate spreader Cues: Uneven lawn compaction Poor drainage, clay soil Lack of top soil on lawn Lack of green color Poor grass growth	Teach tractor safety before initial use Use well-maintained equipment only
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Tractor, rake combination of simple machines] Centrifugal forces developed by bodies in rotation [Spreader develops centrifugal force to dispense gypsum]	Measures of weight; Liquid and dry measures; Ratio and proportion; Read and interpret charts, tables, and/or graphs [Calculation of volume of soil needed and conversion to tons] Measure of time and speed [Time needed to do job]	Read: Label of gypsum bag Write: Record time needed for job

Duty J Balling and Burlapping Trees and Shrubs

1 Tie up trees and shrubs
2 Mark the diameter of the ball
3 Dig trees and shrubs
4 Place burlap around the ball
5 Pin and lace ball
6 Remove ball from hole
7 Back fill the hole
8 Clean tools for storage

(TASK STATEMENT) TIE UP TREES AND SHRUBS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Twine Trees Shrubs Knife Foreman's work order	Tie knot to secure twine to trunk Bend limbs upward and toward trunk and wind the twine around tree crown to hold branches in place Tie end of twine so that knot will hold Know meaning of digging tag Know different colors used for each days digging	Safety glasses to avoid switching branches into eyes Use sharp knife Cut hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Relationship of force to distortion in an elastic body [Excess force breaks limbs]		Read: Foreman's work order to determine what kind and size of tree is to be dug; note digging tag on plants in nursery

(TASK STATEMENT) MARK THE DIAMETER OF THE BALL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shrub Tree Spade Twine Calipers 10' tape	Use twine to mark circumference of large ball Estimate proportion of ball to size of tree trunk or height Use spade to mark ball circumference	Wear protective clothing—heavy shoes Arch injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Use of arcs or chords in determining facts about a circle or its parts [Marking circle with twine] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring in other than linear, square, and cubic) [Caliper use] Measures of length [Height of plant] Ratio and proportion [Calculating size of ball diameter relative to size of plant]	

(TASK STATEMENT) DIG TREES AND SHRUBS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tree Shrub Spade Shovel Vermeer tree digger Jiffy baller Ditcher	Use shovel to trench Use spade to cut roots and dig under ball Perform sequence of shoveling techniques needed to dig plant without breaking ball Use and operate Vermeer tree digger, Jiffy baller, and ditcher Select method needed	Protective clothing including heavy shoes, gloves Use well-maintained equipment
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Digging plant with shovel and spade] Effects of friction on work processes and product quality [Excess friction cracks ball] Relationship of force to distortion in an elastic body [Excess force breaks ball]		Read: Operator's manuals for Jiffy baller, ditcher, Vermeer tree digger Watch and listen: To demonstrations

(TASK STATEMENT) PLACE BURLAP AROUND THE BALL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Burlap squares Dug trees Dug shrubs Burlap, draw-string bags	Place draw string bags around plants dug with Vermeer or Jiffy baller Push folded burlap beneath ball as it sits in hole Shift ball onto folded burlap and pull folded burlap to other side	Fingers may be mashed beneath ball if it is not held firmly
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Inertia and momentum [Moving of balled plant–force required]	Estimating area of burlap needed to cover ball	Verbal: Commands to co-workers

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(TASK STATEMENT) PIN AND LACE BALL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pinning nails Burlapped balls Lacing rope Knife	Select fastening method Use pinning nails Fold burlap to attain neat ball Use correct knots in lacing rope to achieve tightness, neatness, and prevent loosening Use lacing patterns Provide burlap handles	Use sharp knife, avoid cutting hands Hand may be stabbed with pinning nails Wear protective clothing Mashed feet
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Motion resulting from two or more forces acting on a point in a body [Pinning and lacing ball aids cohesion of ball and shape of ball determine necessity of pinning or lacing] Work input, work output, friction and efficiency in simple machines [Rusted pinning nails difficulty in penetrating burlap]		Verbal: Commands to co-workers

(TASK STATEMENT) REMOVE BALL FROM HOLE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Balled and burlapped trees Balled and burlapped shrubs Tractor with left chain Shovel Burlap "handles" Wagon Chain	Select method of moving from hole Prevent breakage of the ball, and damage to plant Load ball and burlapped stock for transport from digging site	Avoid lifting heavy loads with back Use machinery when possible Make sure chain fastenings are secure Avoid use of poorly maintained equipment
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Machines decrease physical labor] Inertia and momentum [Force required to move plant from hole] Effects of friction on work processes and product quality [Avoid slippage of chain against trunk—damage and low plant quality]		Verbal: Commands to co-worders

(TASK STATEMENT) BACKFILL THE HOLE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Backfill soil Hole Shovel Tamper	Backfill holes as a safety factor List specific hazards connected with unfilled or poorly filled holes	Wear gloves Blisters Tamp soil to avoid settling and subsequent possibility of walking or driving unexpectedly into a hole Upset tractors and equipment Tractors and equipment becomes mired in hole People break legs, ankles, slipping in holes
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines ued to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Shoveling soil]		Speak: Commands and encouragement to crew to backfill holes

(TASK STATEMENT) CLEAN TOOLS FOR STORAGE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shovels Spades Tractor Chain Water Brush Cloth Scraping tool	Select proper method of cleaning each piece of equipment Oil and maintain equipment on a periodical basis Store tools in accessible place, protected from weather and easily inventories	Wear protective clothing Injury to hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment helps maintain operating condition, presents a favorable image to customer, and helps instill pride in quality of work by crew Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt; oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Counting—inventorying tools to ascertain that none are left on site	Read: Labeled tool board for hand tools

Duty K Wrapping, Guying and Staking Trees

1 Place stakes
2 Place eyescrews on protective hoses
3 Attach guy wires to tree and stake
4 Repair tree wounds
5 Apply protective paint
6 Apply insecticide
7 Place tree wrappings on the trunk
8 Clean work area and tools

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(TASK STATEMENT) PLACE STAKES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Stakes Sledge hammer Axe "Off the Board/Into the Ground" Gary O. Robinette Kendall/Hunt Publishing Company Dubuque, Iowa	Observe wind direction Develop aesthetic sense of stake placement--placed so not distracting Select method of staking when not dictated Sharpen drive stakes	Gloves Splinters from stakes Proper technique of holding a stake while driving Injury to hand by decending sledge Use firm base beneath stake end while sharpening Slippage Safety glasses Flying chips and splinters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Transfer of energy from one form to another [Use of sledge and axe]	Measures of length [Distance from tree trunk] [Length of stakes]	Read: Specifications for staking Inquire how designer or architects prefer plants to be staked Read: Pages in Robinette on staking before initial experience with each staking method

(TASK STATEMENT) PLACE EYESCREWS OR PROTECTIVE HOSES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Stakes Eyescrews Garden hose pieces Wire Knife Pliers Robinette "Off the Board..." pages 160, 146,149 Landscape specifications	Determine function of protective hoses and eyescrews Cut hose to fit specific plant Place eyescrews in trunk Select hose or eyescrews method	Gloves Splinters in hands Use sharp knife and cut hose against a firm base Cuts to hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of pliers, knife, screws]	Linear measure [Length of wire, and hose needed]	Read: Specification to check what method is required

(TASK STATEMENT) ATTACH GUY WIRES TO TREE AND STAKE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Guy wires Trees Stakes Eyescrews Turnbuckles Pliers Hose Lever—steel rod, or handle	Attach wires to turnbuckles and use turnbuckle to tighten wires Use double wire and use twist to tighten guy wires	Bend wire ends double so that sharp protrusions are avoided Puncture wounds Wear gloves Scrapes, cuts and blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Lever to apply twist turnbuckles]		Read: Architects specifications to determine if method to be used is prescribed

(TASK STATEMENT) REPAIR TREE WOUNDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Knife Wound compound Pruning saw Wooden paddle Chisel, mallet	Diagnose wound and select type of repair needed Shape wound, and clean Apply wound compound	Use properly maintained tools Breakage of tool and subsequent injury Wear protective clothing Cuts, bruises
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines (Applicators, knife, wedges)		

(TASK STATEMENT) APPLY PROTECTIVE PAINT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Asphault emulsion Spray paints Spatula or wooden paddle White wash Sprayer Detergent Water	Determine need for protective paints, and know reasons for a applying protective paint Mix white wash solution Apply method for each compound, and select correct measure to suit problem Clean sprayer and equipment	Wear protective clothing Inhaling fumes Clean all equipment to maintain operational condition
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Differences in absorption and radiation of energy between dark, rough surfaces and light, smooth, polished surfaces [Whitewash prevent sun scald] Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Applicators] Fluids under pressure [Spray cans]	Ratio and proportion [Mixing whitewash solution]	

(TASK STATEMENT) APPLY INSECTICIDE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Destructive insects Insecticides Sprayer Water Volume measuring device Detergent Control recommendations	Identify destructive insects and select appropriate control methods Mix insecticide solutions Measure wettable powders Measure emulsifiable concentrate Clean application equipment	Use respirator and other protective equipment Toxic dust and fumes Clean equipment and bury empty containers Store pesticides out of reach of children
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Sprayers] Fluids under pressure [Water under pressure in sprayer]	Addition and subtraction of whole numbers, Changing percents to fractions and fractions to percents, Liquid and dry measures, Ratio and proportion [Calculating amount of pesticide to use and mixing solutions] Read and interpret charts, tables, and/or graphs [Reading charts on pesticide labels]	Check and read: Compatability charts when mixing one or more insecticides Read: Insecticide labels Insect control recommendations

(TASK STATEMENT) PLACE TREE WRAPPINGS ON TH TRUNK

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tree wrap Tree Twine Knife Landscape specifications	Recognize the need for tree wrapping Select correct size of tree wrap Fasten and begin the wrapping operation Wrap the trunk and end the wrapping operation (fastening) Use twine to fasten	Use sharp knife Cutting hands

SCIENCE	MATH -- NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage [Knife used to cut twine and paper]	Linear measurement [Width of tree wrap]	Read: Architect's specifications to determine method required

(TASK STATEMENT) CLEAN WORK AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wheelbarrow Rake Water Brush Tools	Pick up debris Sweep grass if needed Wash tools, dry and oil moving parts	Wear gloves Cuts
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Record tasks completed and time required to complete job

Duty L Preventing Winter Dar ge in Landscape Plantings

1 Mound up roses
2 Spray shrubs with anti-dessicants
3 Apply wind breakers

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(TASK STATEMENT) MOUND UP ROSES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rose plants Mulch Straw Shovel Customer work request	Determine time of season to conduct operation Identify roses (as type—not cultivar) Mound mulch to correct depth around rose, also diameter Use tools to form mound	Wear gloves Blisters and thorn wounds
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Transfer of heat from one body to another [Value of insulation in keeping plant alive through winter] Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of shovel and condition of shovel which aids efficiency]		Read: Customer work request Speak: Tell customer when and how mound should be removed

(TASK STATEMENT) SPRAY SHRUBS WITH ANTI-DESSICANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sprayer Anti-dessicants Water Detergent Shrubs Volume measuring device Landscape specifications	Identify shrubs which benefit from application of anti-dessicants Select anti-dessicants Mix anti-dessicants Apply methods Clean applicators	Wear respirator Inhaling anti-dessicants Clean equipment to maintain safe working conditions

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Effect of heating and cooling on expansion of materials [Sequential warm and cool days allow flaking off of anti-dessicants] Effect of heating and cooling on state of matter (Change of matter from one form to another) [Sun shining on leaves causes loss of water through transpirator; frozen water cannot be taken in through roots to replace water lost] Fluids under pressure; Relationship of force to distortion in an elastic body [Anti-dessicants hold leaf water under some pressure and allows retention of water in plant]	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents; Liquid and dry measures; Ratio and proportion [Calculating amount of anti-dessicant to use and mixing solutions] Read and interpret charts, tables, and/or graphs [Read charts on anti-dessicant labels]	Speaking: Telling customer about improvements in plant growth and health occuring when anti-dessicants are applied to specific plants Suggestive selling Actually providing a service Reading: Landscape specifications

(TASK STATEMENT) APPLY WIND BREAKERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Stakes Burlap Sledge hammer Wire Pliers Twine Pinning nails Knife	Identify need for wind breakers Select method of breaking wind Construct wind breaker	Avoid mashing hands with sledge or hitting people working in same area Wear gloves to prevent blisters Blisters, nail punctures Use sharp knife Cutting hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Effects of friction on work processes and product quality [Wind velocity, or friction against leaves gives a drying effect– heat encourages transpiration from leaf]		Read: Landscape specifications to see if wind breakers are required Speak: Suggest wind breakers to customer

Duty M Maintaining Hand Tools

1 Sharpen hand tools
2 Replace handles
3 Clean, paint, and oil tools
4 Identify hand tools

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(TASK STATEMENT) SHARPEN HAND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Knives Axe Saws Hand pruners and loppers Files Electric grinder Whetstone Oil Vise	Determine need for sharpening Know function of tool Select method of sharpening specific tool Perform method of sharpening technique Cue: Poor or difficult cutting performance Too much effort required to achieve goals	Wear safety glasses Sparks, metal chips Wear gloves Blisters, scrapes
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Use of files, vise, etc.] Effects of friction on work processes and product quality [Friction produces heat which could destroy temper] Work input, work output, friction and efficiency in simple machines [Sharp tools reduce physical labor]		

(TASK STATEMENT) REPLACE HANDLES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tools with broken handles New handles Hammer and punch or drill Knife or grinder Saw Vise	Remove handle from tool Shape new handle to fit the tool Insert and fasten or tighten handle Cue: Broken or cracked handles Loose handles	Wear gloves Splinters in hands Safety glasses Splinters, sparks Dispose of broken handle in proper place Splinters, puncture wounds

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage [Punch, knife, etc] Inertia and momentum [Force applied in shaping must be controlled by using vise to prevent motion of handle] Effects of friction on work processes and product quality [Friction against handle induces wear or shaping]	Measures of length [Determining proper length of handle] Determination of the volume of a ring [Determine size of ring so that size of handle can be accordingly shaped]	Read: Notice tags left on tools by workers which indicates need for repair

(TASK STATEMENT) CLEAN, PAINT, AND OIL TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wire brush and steel wool Water and hose Detergent Paint Masking tape Oil Cloths Paint brush Spray cans	Determine need for cleaning, painting or oiling tools Select method of cleaning or painting, and apply oil to moving or rusted parts Cue: Rusted appearance Unsightly appearance	Respirator Breathing or ingesting toxic materials Clean equipment to maintain safe operating condition Set newly painted tools in "Wet Paint" area until dry
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Record time required to maintain hand tools, list tasks

(TASK STATEMENT) IDENTIFY HAND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shovels Spades Half-moon edgers Hedge shears Loppers Pruning saws Pole pruners Hammers Sledges Hoes Mattocks Axe File Broom Rake–broom Rake–garden Post hole digger Tamper Breaker Sprayers Spreaders Seeders Trowels Knives Whetstone Reference materials Labeled tool board	Look at reference material and compare pictures and descriptions to actual tools Identify hand tools by labeling, matching inventory cards, or by placing on tool board	Good housekeeping Falls or falling objects
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Read: Reference materials Labeled tool board Inventory cards Write: Identification labels

Duty N Caring for Wounds on Woody Plant Materials

1 Clean wounds
2 Shape the wound
3 Fill the wound cavity
4 Clean work area
5 Clean equipment

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(TASK STATEMENT) CLEAN WOUNDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Knife Tree wound Chisel Mallet Saw Brush Scraping tool Rope Slings Safety belt Hard hat Protective clothing Heavy shoes	Identify a tree wound which needs repair Decide what material must be cleaned out of wound, and select method Remove material from wound	Use sharp chisel and knife Cutting hands Wear gloves Cuts, scratches and bruises Safety glasses Injury due to flying wood chips Clean up area beneath plant Injury to feet and ankles Use safety equipment if working above ground level Falls
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Scraping tool, chisel] Work input, work output, friction and efficiency in simple machines; Effects of friction on work processes and product quality [Well maintained tools reduce damage] Cleaning discourages disease infestation		Sight: Warning signs Verbal: Commands to keep people from beneath tree on which work is being done

(TASK STATEMENT) SHAPE THE WOUND

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Knife Tree wound Chisel Mallet Saw Rope Slings Safety belt Hard hat Protective clothing Heavy shoes	Shape wounds into oval for drawing and healing Use knife, mallet and chisel to shape wound	Use sharp knife and chisel Cutting hands Wear gloves Blisters Use of ropes, saddles when working high Falls
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Chisel, knife] [Gravity (water seeks the lowest level)] Proper shaping induces flow of rain downward and out of wound area	Recognition of eliptical or oval shapes	Read: Warning signs -keep from beneath the tree when working high

(TASK STATEMENT) FILL AND PAINT THE WOUND CAVITY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wound cavities Shellac Wound compound Cement Spray wound paint Brush Rope Saddles Safety belt Hard hat Protective clothing Heavy shoes	Select wound compound appropriate to problem Mix compound as needed Apply methods for each type of wound compound	Keep people from beneath the tree Dropping materials Use safety equipment and wear protective clothing Cuts or minor wounds

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Effect of heating and cooling on expansion of materials [Selection of compound which will resist cracking and peeling due to temperature changes] Fluids under pressure [Spray wound compound]	Liquid and dry measures [To mix cement]	Speak: Request that people stay away from tree while work is being done in the crown area Read: Sign and/or verbal and/or warning flag Directions on wound compound label

(TASK STATEMENT) CLEAN WORK AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rake Leaf bags Shovel Wheelbarrow Arborist's equipment	Remove all debris from around shrub or tree Rake clean Level surface soil	Wear gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Removing prunings promotes health of plants, helps prevent fungus diseases and presents neat appearance		Verbal: Commands to co-workers to insure organization of work

(TASK STATEMENT) CLEAN EQUIPMENT FOR STORAGE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Organic solvents Cloths Water Detergent Foreman's work sheet Oil	Select solvent for cleaning task Clean and oil rusted or moving parts Sharpen tools if needed	Place saws and sharp edged tools in cases for storage Dulling of edge and cuts Avoid inhaling or ingesting toxic materials
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment helps maintain operating condition, presents a favorable image to customers, and helps instill pride in quality of work by crew Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt; oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Record time needed for job

Duty O Controlling Disease in Landscape Plantings

1 Calibrate sprayers
2 Identify plant diseases
3 Select control measures
4 Apply control measures
5 Clean equipment

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(TASK STATEMENT) CALIBRATE SPRAYERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sprayers Containers Water Timing device Volume measuring device Paper Pencil Scale Pesticides Operator's manuals	Identify sprayers and the method of dispensing material Calculate delivery rate of application Determine rate of application desired and dilution of chemical solution Suggest use of CO_2 cylinders as providing steady pressure, and making calibrature easier	Not necessary to actually handle or mix pesticides in order to calibrate applicator
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Ratio and proportion [To figure amount of pesticide needed, dilution of solution] Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight; Liquid and dry measures; Measure with the Metric and English system and convert between them [Determination of amount of pesticide solution dispensed]	Read: Labels on pesticide containers to determine rate of dilution Operator's manual for possible presentation of needed information

(TASK STATEMENT) IDENTIFY PLANT DISEASES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Diseased plants Reference material Pencil Paper	Compare diseased plants to pictures and descriptions in reference materials Label plant disease	Avoid inhaling disease spores–respirator
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Taxonomy of plant diseases		Read: Refr... ...terial Write: Identificati... ...bels

(TASK STATEMENT) SELECT CONTROL MEASURES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Disease control recommendations from state university	Identify specific disease Identify host plant Select control method from recommendations using above information Identify need for spreader or sticker	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Taxonomy of plants and plant diseases Surface tension of water–use of spreader Lack of cohesion of pesticide to leaf surface–sticker		Read: The disease control recommendations

(TASK STATEMENT) APPLY CONTROL MEASURES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hand sprayer—calibrated Pesticide Water Volume measuring device Gloves Respirator Detergent Tractor mounted sprayer	Mix pesticide at recommended dilution Select applicator appropriate for job Observe spray pattern and prevent overlap Add spreader or sticker as recommended by label	Wear respirator and rubber gloves (in addition to other protective equipment) Inhaling or ingesting toxic materials Erect signs in sprayed are if material has residual toxicity
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Addition and subtraction of whole number; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Ratio and proportion; Measure with the Metric and English system and convert between them [Figure dilution of solution for specific size sprayer and area] Measures of weight; Liquid and dry measures [Measurement of pesticide to use]	Read: Pesticide label Spreader and sticker label

(TASK STATEMENT) CLEAN EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water Detergent Empty pesticide bottles Cloth	Empty sprayer of excess solution Add water, rinse, empty Add water, rinse, empty Add water and detergent and run through sprayer Add water and rinse, and run through sprayer Repeat steps 4 and 5 Clean all equipment, lines and nozzles	Bury empty pesticide containers Dispose of detergent solution from sprayer in a safe place Avoid contact of spray solution with body–protective clothing

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Fluids under pressure; Transfer of energy from one form to another [Air pressure used to dispense cleaning solution through sprayer]		Write: Tag non-functional equipment for repair purpose

Duty P Controlling Weeds in Landscape Plantings

1 Identify weeds
2 Calculate type and amount of herbicide to use
3 Apply herbicides
4 Clean equipment

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(TASK STATEMENT) IDENTIFY WEEDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Weeds Reference materials Labeling materials	Compare weed samples to reference materials and label Note discrimination between broad and narrow-leafed weeds	Avoid poison ivy Blisters, itching Wear protective clothing when collecting weed specimens
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Taxonomy of plants		Read: Reference materials—suggest materials from O.M. Scotts, Marysville, Ohio

(TASK STATEMENT) CALCULATE TYPE AND AMOUNT OF HERBICIDE TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
State Recommendations for Weed Control (University Bulletin) Paper Pencil Measuring wheel	Identify specific weed infestation Identify landscape plants which are infested with weeds Select herbicides as per recommendations considering above information Read herbicide label to determine dilution	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Taxonomy of plants Fluids under pressure; Tranfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Ratio and proportion [To figure amount of pesticide needed, dilution of solution] Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight; Liquid and dry measures; Measure with the Metric and English system and convert between them [Determination of amount of pesticide solution dispensed]	Read: Weed control recommendations Herbicide labels

(TASK STATEMENT) APPLY HERBICIDES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Gloves Respirator Wettable powder herbicides Emulsifiable concentrate herbicide Spreaders Stickers Sprayers Weed infested areas Pre-emergence herbicides Post emergence herbicides Mixing equipment	Mix herbicide considering capacity of applicator and area to be covered Select applicator and apply herbicide to area considering dispensing pattern and overlap	Wear protective clothing to avoid skin contact by herbicides, and inhaling or ingesting toxic materials
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Surface tension of water–spreader Lack of cohesion of pesticide to leaves–use sticker Fluids under pressure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Ratio and proportion; Measure with the Metric and English system and convert between them [Figure dilution of solution for specific size sprayer and area] Measures of weight; Liquid and dry measures [Measurement of pesticide to use]	Read: Compatability charts Herbicide labels

(TASK STATEMENT) CLEAN EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water Detergent Empty herbicide containers	Empty sprayer of excess solution Add water, rinse, empty Add water, rinse, empty Add water and detergent and run through sprayer Add water and rinse, and run through sprayer Repeat steps 4 and 5	Avoid contact with cleaning solution which contains herbicide Bury empty pesticide containers
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressue; Transfer of energy from one form to another [Air pressure used to dispense cleaning solution through sprayer]		Label non-functional equipment for later repair

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Duty Q Controlling Insects in Landscape Plantings

1 Identify destructive insects
2 Select type and amount of insecticides
3 Clean equipment

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(TASK STATEMENT) IDENTIFY DESTRUCTIVE INSECTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Destructive insects Mounting board Mounting pins Killing bottle and solution Reference materials	Collect destructive insects as listed by reference materials Kill and pin insects to mounting board–label Learn damage caused by each type of insect	Avoid stinging insects when making collections Avoid inhaling and ingesting killing solutions
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Insect taxonomy		Read: Reference materials to identify insects

(TASK STATEMENT) SELECT TYPE AND AMOUNT OF INSECTICIDES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Insecticide recommendations from state university Insecticides Measuring wheel Paper Pencil	Identify insect by looking at insect or at damage caused by insect Read insect control recommendations and find controlling a agent Calculate area requiring a application of insecticide Note calibration of sprayer and dilution recommendations on pesticide label	Insecticide need not be handled to obtain needed information
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant taxonomy, insect taxonomy Fluids under pressure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Ratio and proportion [To figure amount of pesticide needed, dilution of solution] Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight; Liquid and dry measures; Measure with the Metric and English system and convert between them [Determination of amount of pesticide solution dispensed] Ratio and proportion; Measure with the Metric and English system and convert between them [Figure dilution of solution for specific size of sprayer and area] Measures of weight; Liquid and dry measures [Measurement of pesticide to use]	Read: Insecticide recommendations Insecticide label

(TASK STATEMENT) CLEAN EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water Detergents	Empty sprayer of excess solution Add water, rinse, empty Add water, rinse, empty Add water and detergent and run through sprayer Add water and rinse, and run through sprayer Repeat steps 4 and 5	Avoid skin contact by detergent, water, pesticide solution Protective clothing
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure; Transfer of energy from one form to another [Air pressure used to dispense cleaning solution through sprayer]		Write: Tag non-functional equipment to indicate needed repair

Duty R Preparing a Planting Bed

1 Rough grading
2 Apply soil amendments
3 Till the soil
4 Finish grading
5 Clean the work area
6 Clean equipment for storage

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(TASK STATEMENT) ROUGH GRADING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tractor, scraping blade and scoop Soil Architect's specifications or customer work request	Add top soil Consider drainage requirements Level and contour land surfaces	Teach tractor safety before initial experience with grading accessories
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Simple machines combine to make tractor, blade and scoop] Inertia and momentum [Force needed to move and level soil] Effects of friction on work processes and product quality [Friction of scoop and blade produces grading effect] Principles of water flow—surface drainage Development of a slope	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skill needed to determine slope] Ratio and proportion [Calculating slope]	Read: Specifications or work request

(TASK STATEMENT) APPLY SOIL AMENDMENTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Organic fertilizer Chemical fertilizer Peat moss Lime Gypsum Sand Spreader Rake Shovel Rototiller Soil test recommendations Blueprint or planting design	Determine need for specific amendments Determine rate of application	Avoid inhaling small particulates--respirator Wear other protective clothing
SCIENCE	**MATH -- NUMBER SYSTEMS**	**COMMUNICATIONS**
Soil service--structure of soil regarding drainage characteristics	Measures of length; Measures of weight; Liquid and dry measures [Determination of volume of soil or amendments needed]	Read: Soil test recommendations Blueprint to determine type of plants to be grown

(TASK STATEMENT) TILL THE SOIL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rototiller Spade Shovel	Select method needed to till planting bed based on size of bed, amount of amendments, condition of soil Avoid use of rototiller on soil with poor physical condition—induces compaction Do not rototill on wet soil	Use only well maintained equipment Wear protective clothing (slacks) Projectiles
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Complex machines are combination of simple machines, and make human labor need smaller] Centrifugal forces developed by bodies in rotation [Rototiller had rotating blades which may cause projectiles] Soil—science—structure of soils, causes of compaction		

(TASK STATEMENT) FINISH GRADING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Grading rakes Sloop shovel Wheelbarrow	Use grading rakes to provide smooth even surface Remove debris and rocks	Wear gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Grading rakes speed process of removing small rocks, clods, and debris]		

(TASK STATEMENT) CLEAN THE WORK AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Push brooms Shovels Wheelbarrows Soil	Remove soil and debris from paved areas Use stiff broom to sweep soil from grass	Gloves Blisters Use machinery to lift heavy loads Back injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Human relations Aesthetics		

(TASK STATEMENT) CLEAN EQUIPMENT FOR STORAGE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tractor and accessories Hand tools Water Hose Nozzle Detergent Scraping tool Brush Foreman's work sheet	Select proper method of cleaning each piece of equipment Use oil and lubricant as needed	Wear protective clothing
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment presents favorable image to customer Ceaning tools helps maintain operational condition Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Record time required to complete job

Duty S Establishing Lawns

1 Cost estimate and price
2 Rough and finish grading
3 Select kinds and amounts of lawn grass seed
4 Apply seed to seedbed
5 Finish the seeded areas
6 Clean area and equipment

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(TASK STATEMENT) COST ESTIMATE AND PRICE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Lawn area Measuring wheel Seed price list Mulch price list Time–labor cost estimates Soil cost list Reference Robinette "Off the Board..." Seed application rates List of characteristics of grasses	Determine area to be seeded Determine type of grass best for area Determine seeding rates and amount of seed needed for area, and cost of seed Estimate top soil, and need for amendments and cost of above Estimate grading costs, labor for seeding and cost of mulching operation Add costs Keep records of several jobs and figure an average cost per square foot for future reference	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Simple arithmetic skills needed to calculate costs of seeds, amount of seed cost of grains] Liquid and dry measures; Measures of weight [Estimation of topsoil needed] Ratio and proportion [Figuring area if it is stepped off instead of measured] Measures of length [Figuring area]	Speak: Tell the customer a price range Write: Estimate sheet to use as reference for billing later

(TASK STATEMENT) ROUGH AND FINISH GRADING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Dozer Fill soil, top soil Tractor and landscape rake Grading rakes	Select method of doing rough grading Obtain dozer work on contract or doing grading with tractor and landscape rake Perform minor finish grading of small areas can be done by hand with grading rakes	Teach large machine safety before initial experience Wear protective clothing

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Simple machines combine to make tractor, blade and scoop] Inertia and momentum [Force needed to move and level soil] Effects of friction on work processes and product quality [Friction of scoop and blade produces grading effect] Principles of water flow–surface drainage Development of a slope Simple machines used to gain mechanical advantage [Grading rakes speed process of removing small rock, clods, and debris]	Measure of time and speed [Time needed to do grading] Multiplication and division of decimal fractions [Calculating cost of grading at wholesale level]	

(TASK STATEMENT) SELECT KINDS AND AMOUNTS OF LAWN GRASS SEED

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
School turf plots Turf grass seeds Coverage data Turf recommendations from state university	Refer to estimate sheet for area and seed suggested Observe school turf plots which show performance of grasses under local conditions Select seed variety Calculate amount of seed needed	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills needed to figure costs of seed needed] Measures of weight [Concept of volume of a pound of various grass seeds]	Read: Turf recommendations Estimate sheet Coverage data Write: Job sheet for person loading landscape truck

(TASK STATEMENT) APPLY SEED TO SEEDBED

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Seed Seed spreaders	Calibrate the seed spreader for the specific grass seed Observe spreader patterns Note overlap tolerated Prevent skipping of lawn areas	Gloves Blisters Wear protective clothing

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Centrifugal forces developed by bodies in rotation [Centrifugal force is used to scatter grass seeds] Gravity is also used in spreading seeds	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight; Liquid and dry measures [Determine amount of seed as dispensed during calibration]	

(TASK STATEMENT) FINISH THE SEEDED AREAS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Fertilizer, lime Rakes Roller Mulching material Water Hose Sprinkler	Apply correct amounts of fertilizer and/or lime with a calibrated spreader Rake in seed Roll seedbed lightly Apply mulching material at accepted rates Water seedbed	Wear protective clothing Blisters

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Centrifugal forces developed by bodies in rotation [Centrifugal force is used to scatter lime and fertilizer] Gravity is also used in spreading lime and fertilizer Simple machines used to gain mechanical advantage [Grading rakes speed process of removing small rocks, clods, and debris] Transfer of energy from one form to another [Weight and rotation of roller push grass seed into intimate contact with soil] Purposes of mulching Weed control Moisture retention Appearance Erosion control	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight, liquid and dry measures [Determine amount of fertilizer and lime as dispensed during calibration] Awareness of linear measurements –square footage Adding–measurements accumulated Multiplication and division with whole numbers [Multiplication–square footage] [Divsion–figuring coverage of mulch] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (measuring in other than linear, square, and cubic) [Tensiometer scale] Liquid and dry measure [Liquid measure–reading calibrated container to estimate volume of water applied]	Speak: Tell customer how to water to insure success of planting Suggest a handout developed for use by customer

(TASK STATEMENT) CLEAN AREA AND EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Push broom Hand tools Truck Water Hose Nozzle Oil Estimate	Remove all soil, seed and debris from paved areas Select correct cleaning procedure for equipment and perform it Oil and maintain equipment as needed	Wear protective clothing
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment presents favorable image to customer Cleaning tools helps maintain operational condition Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Cleaning paved areas prevents tracking of seed, mulch and soil into house	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Record time required to establish lawn and correct estimate of materials to match actual amount used

Duty T Applying Fertilizer and Lime

1 Read soil test lab recommendation and determine amount to use
2 Apply lime and fertilizer
3 Clean the area and tools

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(TASK STATEMENT) READ SOIL TEST LAB RECOMMENDATION AND DETERMINE AMOUNT TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Soil test lab recommendations Pencil Paper Measuring wheel Fertilizer bags	Measure area to be fertilized and figure square footage Use soil test recommendations and fertilizer analysis Calculate application rate per 1000 ft^2 Calculate amount needed for area to be fertilized	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers [Figure square footage] Changing percents to fractions and fractions to percents [Knowledge of linear systems of measurement—length, width]	Read: Soil test recommendations Fertilizer bag labels

(TASK STATEMENT) APPLY LIME AND FERTILIZER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Calibrated spreader Gloves Safety glasses Protective clothing Lime, fertilizer	Observe spreading pattern Avoid skipping Apply ½ rates in crossing pattern Avoid spillage on planted areas	Wear protective clothing to prevent skin, eye exposure to fertilizer and lime

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Centrifugal forces devleoped by bodies in rotation [Centrifugal force is used to scatter lime and fertilizer] Gravity is also used in spreading lime and fertilizer	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight; Liquid and dry measures [Determine amount of lime and fertilizer as dispensed during calibration]	

(TASK STATEMENT) CLEAN THE AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water Hose Spreaders Oil	Use appropriate cleaning method, dry to prevent rusting Oil moving parts	Avoid splashing water Fertilizer solution into eyes Safety glasses Respirator Inhaling acid fumes
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Clean equipment present favorable image to customer Cleaning tools helps maintain operational condition Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Tag broken equipment for later repair Record time needed to do job

Duty U Planting Hedges and Screens

1 Dig the hole or trench
2 Place plants in holes or trench
3 Mix the soil and amendments
4 Backfill the hole with soil mix
5 Water the planting
6 Mulch and edge the planting
7 Untie plants
8 Groom the plants
9 Clean the area and equipment

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(TASK STATEMENT) DIG THE HOLE OR TRENCH

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Chalk line and stakes Shovel Spade Tarp Hammer Planting plan Hose	Layout site of hedge with chalkline and stakes, hose for curved hedges Dig trench with front edge vertical Place excess soil on tarp for easy clean up Dig hole for screw plants proper size, depth and form	Gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Use of shovel and spade to dig]	Count numbers of holes needed as listed on planting plan and size	Read: Planting plant to determine site of hedge or screen

(TASK STATEMENT) PLACE PLANTS IN HOLES OR TRENCH

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Balled plants Bareroot plants Hole Spacing recommendations for trench, planting	Stand hedge plants flush against vertical front edge of trench Place ball and burlapped stock upright in a hole with vertical sides which allows plant to set at same level as it grew and with a six-inch clearance on all sides	Roll large ball and burlapped stock instead of lifting
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Measures of length [Distance between plants in trench] [Clearance between sides of hole and ball of plant]	Read: Spacing recommendations

(TASK STATEMENT) MIX THE SOIL AND AMENDMENTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Soil Peat moss Fertilizer Shovel Tarp Wheelbarrow	Know soil structure, fertility, and plant requirements Add needed amounts of amendments to soil and mixing together on tarp and wheelbarrow Note that organic fertilizer does not burn tender new roots and has a longer residual effect that chemical fertilizer	Gloves Blisters

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained shovel to mix soil] Soil science—properties of organic and inorganic fertilizers	Ratio and proportion [Proportion of soil amendments to soil used]	

(TASK STATEMENT) BACKFILL THE HOLE WITH SOIL MIX

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shovel Soil mix Plant standing upright in hole or trench	Fill around the plant about halfway Tamp with foot or fill hole with water and let water sink before filling hole with remaining soil mix Make a dish or basin around deciduous plants to catch water	Protective clothing (gloves) Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained shovel to backfill hole] Transfer of heat from one body to another [Transfer of force of gravity and momentum to compaction of soil] Displacement of air pockets by water acting under gravitational force Soil science–soil structure		

(TASK STATEMENT) WATER THE PLANTING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hose Water Sprinkler Customer	Place and adjust hose to obtain deep and thorough watering	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Measures of time and speed [Time and speed of penetration of water into soil]	Speak: Telling customer how to water planting throughout growing season Recommend development of a handout for such purposes

(TASK STATEMENT) MULCH AND EDGE THE PLANTING.

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shredded bark mulch Half-moon edger Wheelbarrow Rake Shovel	Select method of edging Remove excess soil, break up clods and make surface of planting bed fine and smooth Firm with back of shovel Apply mulch to cover ground surface Water mulch to hold	Gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Purposes of mulching Weed control Moisture retention Appearance Erosion control Work input, work output, friction and efficiency in simple machines [Oil weight must be used to provide proper lubrication of engine parts] Simple machines used to gain mechanical advantage [Use of funnel (wedge)] Effect of heating and cooling on expansion of materials [Heat transfer from engine to gasoline] Indestructability of energy and matter [Gasoline may burn producing heat energy] Work input, work output, friction and efficiency in simple machines; Simple machines used to gain mechanical advantage [Sharp edge reduces shearing force needed allowing decreased wear on machine]	Awareness of linear measurements–square footage Adding–measurements accumulated Multiplication and division with whole numbers [Multiplication–square footage] [Division–figuring coverage of mulch] Linear measurement [Determine thickness of mulch application] Liquid and dry measures [Liquid measure–gallons needed for tank] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measure in other than linear, square, and cubic) [Amount of gasoline or oil needed to fill without overflowing]	

(TASK STATEMENT) UNTIE PLANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Plants Twine Knife	Remove twine from all plants Release bent and crossed limbs	Gloves, sharp knife Cut fingers
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Relationship of force to distortion in an elastic body [Excess force breaks limbs]		

(TASK STATEMENT) GROOM THE PLANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Plants Hand pruners	Trim off broken branches, twigs, diseased limbs, crossovers, dead limbs, and brown leaves	Gloves Splinters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of sharp tools decrease physical effort needed to complete pruning tasks] Relationship of force to distortion in an elastic body [Sharp tools leave a clean edge which promotes easier healing]		

(TASK STATEMENT) CLEAN THE AREA AND EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tarp Wheelbarrow Shovels Truck Soil Broom Rake Foreman's work sheet Oil Water	Remove soil from tarp Sweep up fine soil from grass with stiff push broom Remove prunings and other debris from area Clean tools with water, dry to prevent rusting and oil if needed	Gloves Blisters, splinters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Record amount of time required to complete job

Duty V Planting Ground Covers

1 Prepare the planting bed
2 Mulch ground covers
3 Identify ground cover plants
4 Plant ground covers
5 Water ground covers
6 Clean up area and tools

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(TASK STATEMENT) PREPARE THE PLANTING BED

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rototiller Peat moss Fertilizer Pre-emergence herbicides Shovel Sod cutter and/or lifter Planting plan	Scalp sod from area if area is in sod Rototill bed and add organic fertilizer and peat moss Till soil to mix Smooth bed by raking Apply herbicide as per label directions Compare weed samples to reference materials and label, Note discrimination between broad and narrow-leafed weeds, identify specific weed infestations, identify landscape plants which are infested with weeds, select herbicide as per recommendations considering above information, read herbicide label to determine dilution, mix herbicide considering capacity of applicator and area to be covered, select applicator and apply herbicide to area considering dispensing pattern and overlap, mix pesticide at recommended dilution, select applicator appropriate for job, know spray pattern and preventing overlap, add spreader or sticker as recommendations include on label	Use well-maintained equipment Mechanical injury to operator Gloves Blisters Respirator, rubber gloves Herbicide toxicity

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Simple machines combine to make tractor, blade and scoop] Inertia and momentum [Force needed to move and level soil] Effects of friction on work processes and product quality [Friction of scoop and blade produces grading effect] Principles of water flow-surface drainage Development of a slope Soil science structure of soil regarding drainage characteristics Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Complex machines are combination of simple machines, and make human labor need smaller] Centrifugal forces developed by bodies in rotation [Rototiller has rotating blades which may cause projectiles] Soil science structure of soils, causes of compaction Simple machines used to gain mechanical advantage [Grading rakes speed process of removing small rocks, clods, and debris]	Addition and subtraction of whole numbers; Finding a percent of a number and what percent one number is of another [Basic arithmetic skills needed to determine slope] Ratio and proportion [Calculating slope] Measures of length; Measures of time and speed [Determination of area and time over which calibration is to occur] Ratio and proportion; Measure with the Metric and English system and convert between them [Figure dilution of solution for specific size sprayer and area] Measures of weight; Liquid and dry measures [Measurement of pesticide to use]	Read: Planting design to locate site of planting bed, and shape of planting bed

(TASK STATEMENT) MULCH GROUND COVERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Peat moss Rake	On firm, smooth planting bed apply ¼ to ½ inch layer of peat moss Rake evenly	Gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Purposes of mulching Weed control Moisture retention Appearance Erosion control	Linear measure [Understanding of ¼ to ½ inch measurement]	

(TASK STATEMENT) IDENTIFY GROUND COVER PLANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pachysandra Myrtle Euorynus Ajuga English Ivy Reference material	Discribe characteristics of each plant List advantages and disadvantages of each ground cover Label each plant as per reference material Test Review Retest	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant taxonomy		Write: Labels, descriptions and characteristics for plants Test

(TASK STATEMENT) PLANT GROUND COVERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Ground cover plants Spacing recommendations Trowel Gloves	Select specific spacing for selected ground cover Dig holes with trowel in diamond pattern and place plants in holes as dug Fill soil around plant and firm Caution Make certain plant roots do not dry out while waiting to be planted Remove all or portions of peat pots from around plants so packaged	Gloves Blisters Knee pad Sore knees
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained trowel to dig holes decreases physical exertion]	Linear measurement [Concept of spacing distance between plants]	Read: Spacing recommendations

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(TASK STATEMENT) WATER GROUND COVERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sprinkler Water Hose Calibrated container	Set up sprinkler Locate water source and connect hose Water ground cover to 1 inch depth Depth of penetration can be figured by placing calibrated container with watering area Amount in container equals depth of penetration	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Measures of time and speed [Time and speed of penetration of water into soil]	Speak: Inform customer of watering technique to be used throughout growing season Read: Recommendation of handout

(TASK STATEMENT) CLEAN UP AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Power edger Wheelbarrow Truck Shovel Rake Sprayers Foreman's work sheet	Edge planting bed and remove excess soil Sweep fine soil off grass with stiff push broom Clean equipment with water, dry and store	Clean edger with spark plug cable detached and engine cooled Electric shock, hot steam, cracked machinery Protective clothing Herbicide solution on skin and in contact with eyes
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: Down time required to complete job Note any discrepancies in quantity of materials used

Duty W Planting Trees

1 Dig the hole
2 Identify trees
3 Place the tree in the hole
4 Mix the soil and amendments
5 Backfill the hole with soil mix
6 Water the planted trees
7 Mulch and edge around tree
8 Stake and guy trees
9 Wrap the tree trunk
10 Clean the area and tools

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(TASK STATEMENT) DIG THE HOLE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shovel Tree Soil Tarp Spade Backhoe Blueprint	Measure ball of tree—use shovel handle as gauge Allow 1 foot larger than size of ball for hole diameter Mark circumference of hole, scalp sod and dispose of sod Remove topsoil to tarp and save Dig hole with straight sides and 2-3 inches deeper than height of ball	Gloves Blisters Use well maintained equipment Puncture wounds and splinters from cracked or broken handles
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Use of shovel and spade to dig]	Count numbers of holes needed as listed on planting plan and size	Read: Blueprint to ascertain location of trees

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(TASK STATEMENT) IDENTIFY TREES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common shade trees Common ornamental trees Reference material	Select trees by shade tree or ornamental classification Height, flowering characteristics Describe leaves, growth habit, and characteristics of plants Match plants with pictures and descriptions in reference materials Label trees Test Review Test	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant taxonomy		Write: Descriptions, labels, tests

(TASK STATEMENT) PLACE THE TREE IN THE HOLE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Twine, knife Ball and burlapped tree Tree cart Chains Tractor or lift truck	Select method of moving tree based on its size and ground conditions Roll tree to hole with one man supporting and protecting top Place tree on cart if ground is solid and move Use tractor and chain if tree is very large, and lower tree into hole Remove chain In other methods roll and gently drop tree into hole	Roll trees or use machines to move large trees Back injury Remove twine with care Knife cuts
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Machines decrease physical labor] Inertia and momentum [Force required to move plant into hole] Effects of friction on work processes and product quality [Avoid slippage of chain against trunk—damage and low plant quality]		Speak: Commands to co-workers to secure cooperation

(TASK STATEMENT) MIX THE SOIL AND AMENDMENTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tarp Peat moss Fertilizer Soil Shovel Wheelbarrow	On tarp, place peat moss and fertilizer and mix with topsoil already on tarp Judge amount of peat and fertilizer to use for size of tree and condition of soil Mix soil until mixture is homogeneous	Safety glasses Particles of peat moss blown by wind
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained shovel to mix soil] Soil science—properties of organic and inorganic fertilizers	Ratio and proportion [Proportion of soil amendments to soil used]	

(TASK STATEMENT) BACKFILL THE HOLE WITH SOIL MIX

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Soil mix Water Shovel	Fill soil mix halfway up around tree ball Tamp or add water to the top of the hole Let water sink completely before completing filling of hole Make basin or dish around top of ball to collect and hold water	Use well maintained tools Splinters, blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained trowel to dig holes decreases physical exertion] Transfer of heat from one body to another [Transfer of force of gravity and momentum to compaction of soil] Displacement of air pockets by water acting under gravitational force Soil science–soil structure		

(TASK STATEMENT) WATER THE PLANTED TREES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hose Water Soil Shovel	Connect hose to water source and adjust to medium flow Place hose end in basin and let run until basin is full and plant is well watered Firm basin with back of shovel as needed	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant used and need for water	Measures of time and speed [Time and speed of penetration of water into soil]	Speak: Instruct customer on watering of tree throughout growing season Read: Recommendation of handout

(TASK STATEMENT) MULCH AND EDGE AROUND TREE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Mulch Half-moon edger Wheelbarrow Shovel Rake Water	Use half-moon edger and cut out sod in circle around tree Cover basin area with ¼ to ½ inch mulch Smooth and water mulch down	Use intact hand tools Splinters, puncture wounds

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Purposes of mulching Weed control Moisture retention Appearance Erosion control Work input, work output, friction and efficiency in simple machines [Oil weight must be used to provide proper lubrication of engine parts] Simple machines used to gain mechanical advantage [Use of funnel (wedge)] Effect of heating and cooling on expansion of materials [Heat transfer from engine to gasoline] Indestructibility of energy and matter [Gasoline may burn producing heat energy] Work input, work output, friction and efficiency in simple machines; Simple machines used to gain mechanical advantage [Sharp edge reduces shearing force needed allowing decreased wear on machine]	Awareness of linear measurements–square footage Adding–measurements accumulated Multiplication and division with whole number [Multiplication–square footage] [Division–figuring coverage of mulch] Linear measurement [Determine thickness of mulch application] Liquid and dry measures [Liquid measure–gallons needed for tank] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring in other than linear, square, and cubic) [Amount of gasoline or oil needed to fill without overflowing]	

(TASK STATEMENT) STAKE AND GUY TREES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Stakes Wire Hose pieces Eyescrews Turnbuckles Pliers Hammer Knife	Observe wind direction Develop aesthetic sense of stake placement–placed so not distracting Select method of staking when not dictated Sharpen and drive stakes Know function of protective hoses and eyescrews Cut hose to fit specific plant Place eyescrews in trunk Select hose or eyescrew method Attach wires to turnbuckles and use turnbuckle to tighten wires Use double wire and twist to tighten guy wires	Gloves Bruises, splinters, puncture wounds, knife cuts Proper technique of holding a stake while driving Injury to hand by decending sledge Use firm base beneath stake end while sharpening Slippage Safety glasses Flying chips and splinters Use sharp knife and cut hose against a firm base Cuts to hands Bend wire ends double so that sharp protrusions are avoided Puncture wounds Wear gloves Scrapes, cuts, and blisters

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Transfer of energy from one form to another [Use of sledge and axe] Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of pliers, knife, screws] [Lever to apply twist turnbuckles]	Measures of length [Distance from tree trunk] [Length of stakes] Linear measure [Length of wire, and hose needed]	Read: Specifications for staking Speak: Inquire how designer or architects perfer plants to be staked Read: Pages in Robinette on staking before initial experience with each staking method Read: Specification to check what method is required Read: Architects specifications to determine if method to be used is prescribed

(TASK STATEMENT) WRAP THE TREE TRUNK

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Trees Tree wrap Twine Knife Landscape specifications	Recognize need for tree wrapping Select correct size of tree wrap Fasten and begin the wrapping operation Wrap the trunk and end the wrapping operation (fastening) Fasten with twine	Use sharp knife Cutting hands
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Knife used to cut twine and paper]	Linear measurement [Width of tree wrap]	Check architect's specifications to determine method required

(TASK STATEMENT) CLEAN THE AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tarp Shovel Rake Wheelbarrow Truck Broom Foreman's work sheet	Remove excess soil from tarp and place on truck Rake up debris from landscape area and sweep paved areas and grass with stiff push broom	Avoid lifting heavy loads Back injuries
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	Write: When trees are planted, record time required to complete job

Duty X Planting Shrubs

1 Dig the hole
2 Identify shrubs
3 Place the shrub in the hole
4 Mix the soil and amendments
5 Backfill the hole with soil mix
6 Water the planted shrub
7 Mulch and edge around the shrub
8 Untie and groom the shrub
9 Clean the area and the tools

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(TASK STATEMENT) DIG THE HOLE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Soil Shovel Ball and burlapped shrub Spade Tarp Blueprint	Measure ball of shrub—use shovel handle as gauge Allow one foot larger than size of ball for hole diameter Mark circumference of hole, scalp sod and dispose of sod Remove topsoil to tarp and save Dig hole with straight sides and 2-3" deeper than height of ball	Maintain tools Splinters, puncture wounds from broken handles Protective clothes Foot injuries due to soft shoes Gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Use of shovel and spade to dig]	Count numbers of holes needed as listed on planting plan and size	Read: Blueprint to ascertain location of shrubs

(TASK STATEMENT) IDENTIFY SHRUBS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common deciduous shrubs Common needle-leafed evergreens Common broad-leafed evergreens Plant keys	Select shrubs by shade or ornamental classification Height, flowering characteristics Match plants with pictures and description in reference materials Label shrubs	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant taxonomy – leaves, growth habit, characteristics		Read: Plant keys, includes command of vocabulary of plant anatomy

(TASK STATEMENT) PLACE THE SHRUB IN THE HOLE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shrub Hole Burlap	Select method of moving shrub based on its size and ground conditions Roll shrub to hole with one person supporting and protecting top Place shrub on cart if ground is solid and move Use tractor and chain if shrub is very large and lower shrub into hole Remove chain	Use mechanical means of moving large shubs Back injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Machines decrease physical labor] Inertia and momentum [Force required to move plant into hole] Effects of friction on work processes and product quality [Avoid slippage of chain against trunk—damage and low plant quality]		Speak: Verbal commands to co-workers to secure cooperation

(TASK STATEMENT) MIX THE SOIL AND AMENDMENTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Soil Michigan peat Canadian peat Fertilizer Shovel Tarp Wheelbarrow	Place peat moss and fertilizer on tarp and mix with topsoil already on tarp Judge the amount of peat and fertilizer to use for size of shrub and condition of soil Mix soil until mixture is homogeneous	Use well-maintained equipment Wounds from broken handles Safety glasses Windy days peat moss may be carried into eyes
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained shovel to mix soil] Soil science properties of organic and inorganic fertilizers]	Ratio and proportion [Proportion of soil amendments to soil used]	

(TASK STATEMENT) BACKFILL THE HOLE WITH SOIL MIX

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shovel Soil mix Water Hose	Fill soil mix halfway up around shrub ball Tamp or add water to the top of the hole Let water sink completely before completing filling of hole Make basin or dish around top of ball to collect and hold water	Well-maintained tools Wounds from broken handles
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained trowel to dig holes decreases physical labor]		

(TASK STATEMENT) WATER THE PLANTED SHRUB

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water Hose Planted shrub	Connect hose to water source and adjust to medium flow Place hose and in basin and let run until basin is full and plant is well watered Firm basin with back of shovel as needed	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Measures of time and speed [Time and speed of penetration of water into soil]	Speak: Instruct customer on watering of shrub throughout growing season Read: Recommendation of handout

(TASK STATEMENT) MULCH AND EDGE AROUND THE SHRUB

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Shredded bark Half-moon edger Shovel Rake Wheelbarrow	Use half-moon edger and cut out sod in circle around shrub Cover basin area with ¼ to ½ inch mulch Smooth mulch and waterdown	Well-maintained tools Wounds from broken handles, overexertion from using improperly sharpened tools

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage [Use of funnel (wedge)] Purposes of mulching Weed control Moisture retention Appearance Erosion control Work input, work output, friction and efficiency in simple machines [Proper oil weight must be used to provide proper lubrication of engine parts] Effects of heating and cooling on expansion of materials [Heat transfer from engine to gasoline] Indestructibility of energy and matter [Gasoline may burn producing heat energy] Work input, work output, friction and efficiency in simple machines; Simple machines used to gain mechanical advantage [Sharp edge reduces shearing force needed allowing decreased wear on machine]	Awareness of linear measurements–square footage Adding–measurements accumulated Multiplication and division with whole numbers [Multiplication–square footage] [Division–figuring coverage of mulch] Linear measurement [Determine thickness of mulch application] Liquid and dry measures [Liquid measure–gallons needed for tank] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) [Amount of gasoline or oil needed to fill without overflowing]	

(TASK STATEMENT) UNTIE AND GROOM THE SHRUB

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Twine Hand pruners Knife Plants	Remove twine from all plants Release bent and crossed limbs Trim off broken branches, twigs, diseased limbs, crossovers, dead limbs, and brown leaves	Sharp knife, gloves Knife cuts
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Relationship of force to distortion in an elastic body [Excess force breaks limbs] Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of sharp tools decrease physical effort needed to complete pruning tasks] Relationship of force to distortion in an elastic body [Sharp tools leave a clean edge which promotes easing healing]		

(TASK STATEMENT) CLEAN THE AREA AND THE TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Leaf bag Wheelbarrow Shovel Push broom Rake Foreman's work sheet	Remove soil from tarp Sweep up fine soil from grass with stiff push broom Remove prunings and other debris from area Clean tools with water, dry to prevent rusting and oil if needed	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measures of time and speed [Time required to do job]	Write: When shrubs are planted, record time needed to do job

Duty Y Applying Herbicides

1 Identify weeds
2 Select type and amount of herbicide to use
3 Mix herbicides
4 Apply herbicides
5 Incorporate herbicides into the soil
6 Clean equipment for storage

(TASK STATEMENT) IDENTIFY WEEDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common weed specimens Key to common weed species Labeling materials	Compare weed samples to reference materials and label Discriminate between broad and narrow-leafed weeds	Avoid poison ivy Blisters, itching
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Taxonomy of plants		Read: Weed key Knowledge of plant anatomy vocabulary

(TASK STATEMENT) SELECT TYPE AND AMOUNT OF HERBICIDE TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Herbicide recommendations from state university Measuring wheel Pencil Paper Herbicide containers	Identify specific weed infestation Identify landscape plants which are infested with weeds Select herbicides as per recommendations considering above information Read herbicide label to determine dilution	Gloves Contact with herbicide bottles which have been opened and soiled
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Taxonomy of plants Fluids under pressure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Measures of length; Measure of time and speed [Determination of area and time in which calibration is to occur]	Read: State weed control recommendations Herbicide labels

(TASK STATEMENT) MIX HERBICIDES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Emulsifiable concentrate herbicides Wettable powder herbicides Stickers Spreaders Mixing equipment and containers Water Sprayers Rubber gloves Respirator Weed control recommendations	Measure amount needed considering size of applicator and recommended rates Mix emulsifiable concentrate according to herbicide label Mix wettable powder by adding small amount of water to applicator which contains measured amount of wettable powder Stir and shake until mixture is homogeneous, then add rest of water Add stickers or spreaders to solution as recommended by herbicide label and herbicide recommendations	Rubber gloves, respirator Body contact with herbicide solutions

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Transfer of energy from one form to another; Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Stirrers] Solubility of pesticides in water solutions	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Ratio and proportion: Measure with the Metric and English system and convert between them [Figure dilution of solution for specific size of sprayer and area] Measures of weight; Liquid and dry measures [Measurement of pesticide to use]	Read: Herbicide labels Weed control recommendations

(TASK STATEMENT) APPLY HERBICIDES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Protective clothing Sprayers Respirator Rubber gloves	Agitate solution to make sure solution has not layered prior to application Apply herbicide to growing weeds till leaves are completely covered with spray and run off point occurs Apply pre-emergence herbicide to evenly spread herbicide over measured area	Protective clothing Body contact with toxic solutions
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Surface tension of water–spreader Lack of cohesion of pesticide to leaves–use sticker Fluids under pressure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Ratio and proportion; Measure with the Metric and English system and convert between them [Figure dilution of solution for specific size of sprayer and area] Measures of weight; Liquid and dry measures [Measurement of pesticide to use]	

(TASK STATEMENT) INCORPORATE HERBICIDES INTO THE SOIL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Disc and tractor Irrigation system Herbicide label	Determine need for incorporation of some herbicides into the soil Select method by consulting herbicide label Set up tractor and disc Establish discing pattern Set up and operate irrigation system	Teach tractor and disc safe operation before initial experience Mechanical injury to operator Respirator On windy days dust and herbicide stirred which can be inhaled
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage, Work input, work output, friction and efficiency in simple machines, Transfer of energy from one form to another [Use of tractor to decrease physical labor] Inertia and momentum [Tractor exerts force on disc to pull across soil]		Read: Herbicide label

(TASK STATEMENT) CLEAN EQUIPMENT FOR STORAGE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Water Detergent Hose Nozzle	Empty sprayer of excess solution Add water, rinse, empty Add water, rinse, empty Add water and detergent and run through sprayer Add water and rinse, and run through sprayer Repeat steps 4 and 5	Protective clothing Herbicide solutions may cause burns, itching, internal disturbances Importance of clean equipment and of cleaning lines and nozzles Maintain good operating condition Reduct chance of contamination

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition presents a favorable image to customer and helps instill pride in quality of work of crew Fluids under pressure; Transfer of energy from one form to another [Air pressure used to dispense cleaning solution through sprayer]	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	Write: Tag non-functional equipment for repair purpose

Duty Z Applying Anti-dessicants

1 Mix anti-dessicants
2 Apply anti-dessicants
3 Clean tools and equipment for storage

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(TASK STATEMENT) MIX ANTI-DESSICANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Anti-dessicant Label directions Water Sprayers Container Measuring device	Measure out amount of anti-dessicant to make solution to fill selected applicator Agitate thoroughly Use aerosol cans when area to be covered is small	Avoid heating aerosol can to increase flow from nozzle Explosion of can

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Taxonomy of plants Fluids under p essure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur]	Read: Anti-dessicant label

(TASK STATEMENT) APPLY ANTI-DESSICANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sprayers Protective clothing Broad-leaf evergreens Bare-root stock Herbaceous transplants Respirator	Determine degree of coverage–top and bottom of leaves and stems Select method of applying–spraying aerosol can, dipping, using hand sprayer	Safety glasses, respirator Drift into eyes and air passages
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Surface tension of water–spreader Lack of cohesion of pesticide to leaves–use sticker. Fluids under pressure; Transfer of energy from one form to another [Compression of air above pesticide solution to dispense liquid as spray]	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measure with the Metric and English system and convert between them; Ratio and proportion [Figure dilution of solution for specific size sprayer and area] Measures of weight; Liquid and dry measures [Measurement of pesticide to use]	Reading: Anti-dessicants' labels to discover application rates for various types of plants

(TASK STATEMENT) CLEAN TOOLS AND EQUIPMENT FOR STORAGE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Detergents Water Sprayers Label directions	Empty sprayer of excess solution Add water, rinse, empty Add water, rinse, empty Add water and detergent and run through sprayer Add water and rinse, and run through sprayer Repeat steps 4 and 5	Importance of clean equipment and of cleaning lines and nozzles Reduct possibility of contaminants
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure; Transfer of energy from one form to another [Air pressure used to dispense cleaning solution through sprayer]		Write: Tag non-functional equipment for repair purpose

Duty AA Installing Edging

1 Measure to determine amount of edging needed
2 Dig to install edging
3 Install edging
4 Clean area and tools

(TASK STATEMENT) MEASURE TO DETERMINE AMOUNT OF EDGING NEEDED

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Measuring wheel 50' fiberglass tape Paper Pencil Curved and geometric bed areas Blueprint	For geometric beds, lay out lines of bed with chalk line and stakes; for free form bed use flexable garden hose to lay out edge and mark further with spade Use various types of equipment correctly and safely Select proper equipment for the job Maintain clean and neat conditions as work progresses Measure edge of bed laid out and figure linear feet of edging needed	Wear gloves Blisters Protective clothing needed Foot injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Linear measure [Use of tape or measuring wheel to measure length of area where edging is to be installed]	Read: Blueprint to locate edging

(TASK STATEMENT) DIG TO INSTALL EDGING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Spade Half-moon edger	Use spade to make slit–trench large enough to insert edging	Gloves Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines; Transfer of energy from one form to another [Use of spade and edger to make slit–trench]		Read: Blueprint to locate edging

(TASK STATEMENT) INSTALL EDGING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common types of edging Edging stakes and anchors Small sledge hammer	Slide edging into slit-trench so that it stands upright and extends above ground level by approximately one inch Fill in slit-trench or squeeze shut by inserting spade vertically into soil to make a parallel slit-trench	Gloves Bruises, blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Transfer of energy from one form to another; Inertia and momentum; Resistance of materials to change in shape [Driving stakes or anchors with sledge]	Linear measure [Concept of one inch]	

(TASK STATEMENT) CLEAN AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wheelbarrow Push broom Rake Shovel Excess soil Foreman's work sheet	Rake up soil and debris, and remove Sweep grass with stiff push broom Wash and dry tools, oil to prevent rust Sharpen tools as needed	Gloves Blisters, splinters

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition, presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	When job is finished, record time needed to do job

Duty BB Laying Sod

1 Identify turf grasses
2 Prepare bed for sod
3 Place sod
4 Water sod
5 Clean sodded areas
6 Clean tools for storage

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(TASK STATEMENT) IDENTIFY TURF GRASSES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common turf grasses Turf grass key Hand lens School turf plots	Collect common turf grasses Compare reference material with samples and identify lime and fertilizer with plant itself Observe each turf grass as it performs under local conditions List advantages and disadvantages of each grass	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant taxonomy		Read: Turf grass key Knowledge of plant anatomy, vocabulary View: Observation of turf plots and discussion of relative performances Write: Tests

(TASK STATEMENT) PREPARE BED FOR SOD

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rakes Fertilizer Lime Spreader Tractor, blade and landscape rake Soil test recommendations	Add topsoil as needed, rough grading, finish grading Apply lime, fertilizer and rake into soil	Gloves Blisters Respirator, safety glasses, protective clo Contact of fertilizer and lime wi ssages, eyes and skin Use well-maintained tools

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Simple machines combine to make tractor, blade and scoop] Inertia and momentum [Force needed to move and level soil] Effects of friction on work processes and product quality [Friction of scoop and blade produces grading effect] Principles of water flow–surface drainage Development of a slope Simple machines used to gain mechanical advantage [Grading rakes speed process of removing small rocks, dirt clods, and debris] Centrifugal forces developed by bodies in rotation [Centrifugal force is used to scatter lime and fertilizer] Gravity is also used in spreading lime and fertilizer	Measure of time and speed [Time needed to do grading] Multiplication and division of decimal fractions [Calculating cost of grading at wholesale level] Addition and subtraction of whole numbers [Figure square footage] Changing percents to fractions and fractions to percents [Knowledge of linear system of measurement–length, width] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight; Liquid and dry measures [Determine amount of lime and fertilizer as dispensed during calibration] Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills]	Read and interpret: Soil test recommendations

(TASK STATEMENT) PLACE SOD

TOOLS, EQUIPMENT, MATERIALS, C3JECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sod strips Prepared bed Tamper Half-moon edger Knife	Determine sodding patterns—stagger joints of sod strips Butt ends and side of strips tightly and firm strip against ground Cut strips with edger or knife to fit contours of planting beds, walks, drives, etc.	Gloves Abrasions on hands

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Transfer of energy from one form to another; Inertia and momentum [Use of tamper to firm sod]		

(TASK STATEMENT) WATER SOD

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hoses Sprinklers Calibrated container	Set up sprinklers so entire area can be watered without walking on sod Avoid walking on sod for ten to fourteen days Apply recommended amount of water initially as listed: Select type of water applicator needed for job based on dispensing capacity and area to be watered Set up and operate watering system, moving as much as needed to cover entire area thoroughly Depth of penetration of water can be deduced by placing open-typed calibrated container within watering area Depth of water in container equals depth penetration	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (measuring in other than linear, square, and cubic) [Tensiometer scale] Liquid and dry measure [Liquid measure—reading calibrated container to estimate volume of water applied]	Speak: Tell customer how to water until it roots into seedbed and throughout growing season

(TASK STATEMENT) CLEAN SODDED AREAS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Push broom Half-moon edger Shovel Wheelbarrow	Remove soil from paved areas Remove other debris (cut sod strips, etc.) from landscape areas	Gloves Blisters, splinters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained tool decreases physical effort needed to do job]		

(TASK STATEMENT) CLEAN TOOLS FOR STORAGE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hand tools Water Scraping tool Oil Foreman's work sheet	Wash and dry tools Oil tools and perform routine maintenance as needed	Safety glasses Chips and sparks when cleaning
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition, presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	Write: When job is finished, account for the time needed to do the job

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Duty CC Planting Perennials and Annuals

1 Prepare the planting bed
2 Identify annuals and perennials
3 Plant perennials and annuals
4 Water new plantings
5 Clean area and tools for storage

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(TASK STATEMENT) PREPARE THE PLANTING BED

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rototiller Fertilizer Lime Peat moss Pre-emergence herbicide Sprayer Lime–fertilizer spreader	Add topsoil Consider drainage requirements Level and contour surface Determine need for specific amendments Determine rate of application Select method needed to till planting bed based on size of bed, amount of amendments, condition of soil Avoid use of rototiller on soil with poor physical condition–includes compaction Do not rototill on wet soil Use grading rakes to provide smooth even surface Remove debris and rocks	Use well-maintained equipment Injury to operaotr Protective clothing Rototiller may injure unprotected feet, lime and fertilizer may burn eyes and air passages, and avoid skin contact by herbicides

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simply machines [Complex machines are combination of simple machines, and make human labor need smaller] [Simple machines combine to make tractor, blade and scoop] Inertia and momentum [Force needed to move and level soil] Effects of friction on work processes and product quality [Friction of scoop and blade produces grading effect] Principles of water flow–surface drainage Development of a slope Centrifugal forces developed by bodies in rotation [Rototiller had rotating blades which may casue projectile] Soil science– structure of soils, causes of compaction –structure of soil regarding drainage characteristics Simple machines used to gain mechanical advantage [Grading rakes speed process of removing small rocks, clods, and debris]	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skill needed to determine slope] Ratio and proportion [Calculation of slope] Measures of length; Measures of weight; Liquid and dry measures [Determination of volume of soil or amendments needed]	Read: Specifications on work request Soil test recommendations Blueprint to determine type of plants to be grown

(TASK STATEMENT) IDENTIFY ANNUALS AND PERENNIALS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common annuals and perennials Garden catalogs	Determine characteristics of each plant List advantages and disadvantages of each ground cover Label each plant as per reference material	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant taxonomy		Read: Garden catalogs View: Look at and compare plants and identification pictures

(TASK STATEMENT) PLANT PERENNIALS AND ANNUALS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Trowel Annuals Perennials	Determine planting pattern within planting bed Dig holes with trowel, push plants from containers and insert into hole Backfill hole and firm soil around plant Caution– Make certain plants do not dry out while waiting to be planted Remove part or all of peat pot from plant if it is so packaged	Gloves Blisters Knee pads Blisters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained trowel to dig holes decreases physical exertion]	Linear measurement [Concept of spacing distance between plants]	Read: Planting plan

(TASK STATEMENT) WATER NEW PLANTINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hose Sprinkler	Set up hose and sprinkler Apply needed amount of water: Select type of water applicator needed for job based on dispensing capacity and area to be watered Set up and operate watering system, moving as needed to cover entire area thoroughly Depth of penetration of water can be deduced by placing open-type calibrated container within watering area Depth of water in container equals depth of penetration	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Measure of time and speed [Time and speed of penetration of water into soil]	Discuss: Watering needed throughout growing season to customer

(TASK STATEMENT) CLEAN AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Edger Push broom Rake Shovel Foreman's work sheet	Edge planting bed and remove excess soil Sweep fine soil off grass with stiff push broom Clean equipment with water, dry	Apply water to edger only when engine is cool Steam injury, damage to equipment
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition, presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	Write: Time required to complete job

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Duty DD Applying Water to Landscape Plantings

1 Analyze soil structure
2 Analyze water needs of plants
3 Apply water
4 Clean tools for storage

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(TASK STATEMENT) ANALYZE SOIL STRUCTURE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Triangular soil structure chart Clay soil sample Sandy soil sample Loamy soil sample Water State soil judging chart	Dig hole through topsoil and into subsoil This can be done on the job location of first hole for a tree Determine texture and physical condition of topsoil and subsoil Determine depth of growth media—if soil is too shallow for tree balls, much modification is necessary to install and grow plants Fill hole with water and note time needed to sink	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Use of well-maintained tools eases physical exertion] Soil science—soil structure	Linear measurement [Determine depth of topsoil]	Read Triangular soil structure chart and state land judging chart

(TASK STATEMENT) ANALYZE WATER NEEDS OF PLANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tensiometer Water deficient plants Potted plants	Examine tensiometer readings of soil in which plants do not seem to need water Examine tensiometer readings of soil in which plants do need watering Observe how much and how often soil needs to be watered to maintain turgid condition of specific plants Observe effects of weather on need for frequency of watering	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Resistance of materials to flow of electrical current [Principle of operation for tensiometer]	Read and interpret charts, tables, and/or graphs [Read tensiometer graph]	Read: Operating directions for tensiometer

(TASK STATEMENT) APPLY WATER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common types of sprinklers Hoses Breakers and roses Underground irrigation systems Water Calibrated container	Select type of water applicator needed for job based on dispensing capacity and area to be watered Set up and operate watering system, moving as needed to cover entire area thoroughly Deduce depth of penetration of water by placing open-type calibrated container within watering area (depth of water in container equals depth of penetration)	Avoid tripping over hose Sprained ankles, broken limbs
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Plant use and need for water	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (measuring in other than linear, square, and cubic) [Tensiometer scale] Liquid and dry measure [Liquid measure—reading calibrated container to estimate volume of water applied] Measure of time and speed [Time and speed of penetration of water into soil]	Read: Calibrations on container

(TASK STATEMENT) CLEAN TOOLS FOR STORAGE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sprinklers Hoses Breakers and roses Cloths	Drain hoses and sprinklers Dry parts to prevent rusting and oiling moving parts	Avoid leaving water on floors Slipping, falls

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Clean equipment helps maintain operating condition, presents a favorable image to customer, and helps instill pride in quality of work by crew Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt; oil relieves some friction in moving parts] Oxidation of metals reduced by painting	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	

Duty EE Using Drafting Tools

1 Identify drafting equipment for each task
2 Use and operate drafting tools
3 Lay out a drawing
4 Make a scale drawing
5 Draw landscape symbols
6 Key a drawing
7 Letter a drawing

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(TASK STATEMENT) IDENTIFY DRAFTING EQUIPMENT FOR EACH TASK

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Architect's scale Engineer's scale Drawing pencils Triangles T-square Drawing boards French curves Compass Overlay paper Circle templates Equipment catalogs	Compare tools with catalog pictures and descriptions, and label correctly Determine function of each tool Select appropriate tools	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Write: Names and descriptions of equipment Read: Catalogs

(TASK STATEMENT) USE AND OPERATE DRAFTING TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting equipment	Manipulate each tool to solve specific operations indicated by supervision Use sequentially different tools to make geometric drawings	Compass Puncture wounds
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Use of drafting tools to make drawing chores easier, neater and more accurate]	Measures of length [Linear measurement system] Geometric constructions [Drawing rectangle with 90^{o} angles, construction of parallel lines] Measure with the Metric and English system and convert between them [Include use of engineer's scale if time allows] Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (measuring in other than linear, square and cubic) [Use of architect's and engineer's scales]	Write: Draw geometric figures to scale

(TASK STATEMENT) LAY OUT A DRAWING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Paper Pencil Measurements of overall sketch	Select size of paper to be used Calculate overall measurements of sketch to be drawn on paper, considering plant key, detail sketches, etc. Select scale to be used considering above information Calculate space on paper which drawing will occupy Figure center of sketch and match to center of paper allowing for key	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers [Figuring space occupied by sketch] Measures of length [Measuring size of given paper] Ratio and proportion [Figuring scale which must be used]	Read: Rough drawing

(TASK STATEMENT) MAKE A SCALE DRAWING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Architiect's scale Triangle Drawing pencil Paper Reference–Nelson "Landscaping the Home Grounds"	Use architect's scale Use scale selected Convert ough measurements to scale measurements and draw accurate geometric figures Use other drafting tools Know symbols used to indicate houses, buildings, walks and related structures, windows, doors, etc.	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage [Manipulation of drafting tools]	Given ar instrument of measure, determine precision, and/or accuracy, with respect to relative error, tolerance and significant digits (Measuring other than linear, square, and cubic); Given a coding system recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Use of scale to draw figures and symbols]	Read: Rough drawing Write: Draw geometric figures to scale

(TASK STATEMENT) DRAW LANDSCAPE SYMBOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Nelson "Landscaping the Home Grounds" Architect's scale Drawing pencil Paper Circle templates Robinette "Off the Board..."	Observe and repeat accepted landscape symbols for deciduous and evergreen trees, deciduous and evergreen shrubs, hedges, planting beds, screens, group plantings, etc. Learn ultimate size of plants as basis of scaled symbol Determine method of indicating existing and proposed plantings	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Manipulation of drafting tools]	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance and significant digits (Measuring other than linear, square, and cubic); Given a coding system recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Use of scale to draw figures and symbols]	Read: "Landscaping the Home Grounds" and repeating the drawings

(TASK STATEMENT) KEY A DRAWING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Triangle Drawing pencil Completed drawing	Color drawing Construct legend Include arrows with plant names directly on drawing	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage [Manipulation of drafting tools]	Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Identifying symbols on scale drawing] Development of graphs comparing two complimentary sets of figures [Developing a legend if numerical key is used]	

(TASK STATEMENT) LETTER A DRAWING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Triangle Architect's scale Drawing pencil Bailey's manual "Cultivated Plants"	Determine acceptable and desirable printing techniques Develop a unique printing style Use correct nomenclature and labeling of plants	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Write: Printing skills Read: Bailey's manual as needed

Duty FF Calling on the Customer

1 Contact the customer initially
2 Analyze the site
3 Determine the needs of the family
4 Measure and make a rough sketch
5 Estimate costs

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(TASK STATEMENT) CONTACT THE CUSTOMER INITIALLY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Telephone book Telephone Customer Pencil Paper Call sheet	Obtain first contact with customer Handle incoming calls Advertising elicits calls from customers Word of mouth advertising from satisfied customers Neighbors of people for whom work is being done elicits interest Make an appointment with customer for consultation–telephone manners Keep the appointment and create a favorable impression	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Human relations		Speak: To customers over telephone, exhibiting friendliness, efficiency and professionalism

(TASK STATEMENT) ANALYZE THE SITE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Pencil Paper Customer Site to be landscaped	Obtain information needed – Style of house Type and setting of property Location of utilities Condition of existing plantings Observation of problems and problem areas Interior arrangement of house and style of decoration	Call ahead before arriving so that animals can be penned Wear appropriate shoes to avoid twisted ankles on rough site
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Speak: To customer to determine location of hidden utilities, and interior arrangement of home

(TASK STATEMENT) DETERMINE THE NEEDS OF THE FAMILY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Site to be landscaped Customer Pencil Paper	Ask what landscaping the customer specifically desires Determine how much family entertains and what its activities and interests are Determine how much time the family cares to spend outdoors and how much they like gardening Ask what landscape the customer particularly likes Ask where customer works and position Determine need for noise barriers and privacy	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Speak: To customer to determine size and activities of family ages of family members, time spent in gardening and maintaining landscape, expected appearance of landscape need for privacy, etc.

(TASK STATEMENT) MEASURE AND MAKE A ROUGH SKETCH

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Measuring wheel 10' steel tape Pencil Paper Customer	Obtain only the measurement necessary to make scale drawing (ex: If foundation planting is sole desire of customer only the measurements across front of house, walk location, drive and garage location, lamp locations are necessary) Select and use appropriate measuring method Sketch area to be landscaped, place measurements on it clearly and indicate other features such as underground utilities, special features	Wear appropriate shoes Sprained ankles
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Linear measurement–estimate measurements of house Ratio and Proportion [Conversion of number of steps walked into linear feet if number of steps per 100 feet is known]	Write: Measurements on rough drawing of house and property Drawing of house and property

(TASK STATEMENT) ESTIMATE COSTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Customer Site to be landscaped	Combine clues given by customer and home to develop an idea of what the customer is likely to want to pay Consider elaborateness of planting desired in estimating costs also difficulties inherent in site Give customer a price rance if possible, if not explain that a drawing must be first developed If no idea is developed as to price customer wants to pay, ask tactfully what he/she has in mind—write down	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
	Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Simple arithmetic skills needed to calculate costs of materials and plants, amount of materials and plants cost] Liquid and dry measures; Measures of weight [Estimation of topsoil needed] Ratio and proportion [Figuring area if it is stepped off instead of measured] Measures of length [Figuring area]	View: observation of apparent wealth of customer—type of house, clothing, car of customer Consideration of knowledge of customer's needs and desires

Duty GG Estimating the Cost of Landscaping

1 Read blueprints and specifications
2 Use catalogs
3 Select plant sizes and relative prices
4 Use an adding machine or calculator to figure costs
5 Calculate labor costs
6 Consider cost of accessory materials
7 Write price quotation sheet or bid
8 Submit price quotations to customer

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(TASK STATEMENT) READ BLUEPRINTS AND SPECIFICATIONS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Blueprints Specifications Paper Pencil	If varieties and sizes of plants are given, list these on a separate sheet, otherwise suggest appropriate varieties and sizes Note special work which must be done and special procedures which vary from the routine Write down materials needed to complete job in addition to plants	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Read, recognize, identify each symbol in blueprint]	Read: Blueprint and specification reading Write: Make note of specific requirements

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(TASK STATEMENT) USE CATALOGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Garden catalogs Wholesale catalogs Local nurseries' price list	For plant materials not available in business, check various catalogs for plant and size needed Write down sources and prices Check with other local nurseries to determine what plants are available from them and their estimation of quality of plants from anticipated sources Locate source of materials other than plants and write down source and price	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Development of graphs comparing two complimentary sets of figures [Develop plant list showing source and price per unit and total cost]	Read: Locating source of materials and matching specifications with available materials Speak: Telephone local nurseries

(TASK STATEMENT) SELECT PLANT SIZES AND RELATIVE PRICES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Price lists Pencil Paper	If blueprint and specifications do not list plant sizes, or if price quotation is being developed for own landscape design, then begin first selection of sizes based on initial aesthetic appearance of planted design Figure fixed costs, add other costs, add cost of plants, and determine if bid is high or low Change amount of bid according to increases or decreases in size of selected plants and thus their relative cost	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rhythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Addition and subtraction of whole numbers [Addition of retail cost of plants; subtraction of total cost from estimate]	Write: Source, price, and size of plants required by specifications to develop rough price list of plants

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(TASK STATEMENT) USE AN ADDING MACHINE OR CALCULATOR TO FIGUR[illegible]OSTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Selected plant prices Adding machine Calculator Pencil Paper	Identify functions of calculator or adding machine key Conduct basic mathematical operations on machines Subtotal costs for groups of materials Total costs	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Familiarity with following operations Addition and subtraction of whole numbers [Subtotal, mistake or credit, total, subtotal, sales tax] Addition and subtraction of decimal fractions [Working with monetary system]	Read: Rough draft of price list of plants

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(TASK STATEMENT) CALCULATE LABOR COSTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pencil Paper Landscape drawing List of plants used in landscape List of accessory materials Foreman's work sheets Robinette "Off the Board..."	Estimate time required to plant, make beds, mulch, install edging, establish lawns or sod, water and cleanup using foreman's work sheets developed on earlier jobs Multiply estimated time by average hourly wage of workers and then multiply by three to determine cost of labor—this includes cost of tools, machinery and trucks, overhead, etc.	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Multiplication and division with whole numbers [Cost per hour multiplied by estimated time to do job]	Read: Rough price list and note size and scope of plants and plantings Considering time needed to complete plantings and to construct other features as required in blueprint and specifications

(TASK STATEMENT) CONSIDER COST OF ACCESSORY MATERIALS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scale landscape drawing Pencil Paper Source—price list previously developed Robinette "Off the Board..."	Determine amount of materials needed and multiply by unit cost Calculate retail value of materials—roughly twice the cost of materials to landscaper (includes freight, overhead, etc.)	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers [Total subtotal] Multiplication and division with whole numbers [Multiply unit cost by number of items]	Read: Price lists and scale drawings

(TASK STATEMENT) WRITE PRICE QUOTATION SHEET OR BID

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pre-printed quotation form Bid form Ink pen Estimates previously developed Robinette "Off the Board..."	Neatly indicate name of business making bid or quotation also address phone number Neatly indicate name, address, phone of business receiving bid List individual prices for groups of materials, labor costs, tax Give total Sign bid on quotation and date Make carbon for office copy	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers [Subtotal, total, sales tax] Multiplication and division with whole numbers [Multiply unit cost by quantity]	Write: Neatly a price quotation or bid sheet to present to customer

(TASK STATEMENT) SUBMIT PRICE QUOTATIONS TO CUSTOMER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Customer Telephone Landscape drawing Landscape estimate	Follow procedure requested in specifications if so stated, otherwise, send large bids by registered mail Mail or personally present bids to customer Present design with bid Decide to mail or personally present quotation to residential customer on basis of size, complexity and price of job Demonstrate personal selling by designer and/or suggestions, e.g. job and cost budgeted across a period of years	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**

Duty HH Designing a Landscape

1 Design an entrance planting
2 Design a foundation planting
3 Design a corner planting
4 Design a public area
5 Design a living area
6 Design a service area
7 Design a annual garden
8 Design a perennial garden
9 Design a rock garden
10 Design for special needs
11 Select appropriate plants for design

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(TASK STATEMENT) DESIGN AN ENTRANCE PLANTING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scale drawing Drafting equipment Nelson's "Landscaping the Home Grounds"	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Draw landscape symbols Key a drawing Letter a drawing Select basic design Select plants closest to doors Cues: Low evergreens are usually used Plants close to door may vary in color, form, and texture from other plants in foundation planting Plants close to door often have colored leaves or ornamental fruits or blooms (i.e., chance to use unusual plants) Plants on either side of door should be relatively low	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rhythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportions of size to house and to door]	Read and repeat: Drawings from Nelson's book

(TASK STATEMENT) DESIGN A FOUNDATION PLANTING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scale drawing Drafting equipment Nelson's "Landscaping the Home Grounds"	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Draw landscape symbols Key a drawing Letter a drawing Select basic design Door is center of attention and planting on one side of door should be balanced by planting on other side considering door as fulcrum Plantings should be tallest close to house corners, lowest at door with medium heights between corner and door Avoid covering windows or blocking windows Cover unsightly foundations Consider ultimate size of plants and avoid crowding Use two or three basic shrubs in planting Indicate bed and mulch between plants to facilitate maintenance	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rhythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of plants to size of house]	Read: Material in Nelson's book regarding foundation planting Repeating: Drawings found in Nelson's book, with varying plant material

(TASK STATEMENT) DESIGN A CORNER PLANTING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting equipment Scale drawing Nelson's "Landscaping the Home Grounds"	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Draw landscape symbols Key a drawing Letter a drawing Design basic planting – Cues: When window is at corner then plants should be massive in width When house is tall a wing planting may be used to decrease apparent height Wing plantings may also be used to provide a fence for a house when it is close to property line and room for a framing shade tree does not exist Use of horizontally limbed tree is good with ranch, split level, or one-story house Use of pyramidal shrubs is good for use with victorian style architecture	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rhythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of plantings to size of house and to main foundation plantings]	Read: Material in Nelson's book regarding corner plantings Repeat: Nelson's drawings with varying plant materials

(TASK STATEMENT) DESIGN A PUBLIC AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scale drawing Drafting equipment Nelson's "Landscaping the Home Grounds"	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Draw landscape symbols Key a drawing Letter a drawing Design foundation planting and select style for planting rest of public area to conform Provide for framing of house Frame views for people looking out windows and block off poor views Provide sound barrier plantings, plantings for privacy as needed, design driveway, walkways and parking to meet needs Provide afternoon shade for house Define property boundaries as needed	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of plant sizes to size of house, size of property and size of other plantings]	Read: Section in Nelson's book regarding planting for public areas and repeating basic designs with various plant materials

(TASK STATEMENT) DESIGN A LIVING AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting equipment Scale drawing Nelson's "Landscaping the Home Grounds"	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Drawing landscape symbols Key a drawing Letter a drawing Define area to be left unplanted and ascertain that its shape conforms to other shapes in landscape Include special recreational features desired Make sure childrens play area can be viewed from kitchen window Plant for privacy as needed Provide large trees in back lawn to provide background for house and afternoon shade on house Define property lines as needed	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of plant sizes to size of house, size of property and size of other plantings]	Read: Section in Nelson's book regarding landscaping of living areas and repeat basic designs with various plant materials

(TASK STATEMENT) DESIGN A SERVICE AREA

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scale drawing Drafting equipment Nelson's "Landscaping the Home Grounds"	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Drawing landscape symbols Key a drawing Letter a drawing Consider services which will be included in the area Provide a screen planting or fence from living area and public area Provide easy access by service personnel, and by customer	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of plant sizes to size of house, size of property and size of other plantings]	Read: Section in Nelson's book on designing service areas Repeat: Basic designs with various plant materials

(TASK STATEMENT) DESIGN A ANNUAL GARDEN

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scale drawings Drafting equipment Garden catalog Garden magazines	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Drawing landscape symbols Key a drawing Letter a drawing Include with living or service area Determine function (color cutting value, psychological) Select effect desired Select shape of planting to conform with other landscaping Determine individual annual requirements of shade, sun, water In border plantings, be certain tallest plants are in back, medium heights in center, small plants at front Avoid beds in middle of lawns	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Color harmony Psychological effects of color Value of color in changing perspective Full sun best colors are livid, warm, strong colors Full, partial shade—best colors are light, pastel colors Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of masses of color to one another, to size of planting bed, and proportions of planting bed to overall planting]	View: Observation of garden plantings and of pictures in garden magazines Repeat the basic desings using various annuals

(TASK STATEMENT) DESIGN A PERENNIAL GARDEN

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON

Drafting equipment
Scale drawing
Wayside Garden's Catalog
Garden catalogs

PERFORMANCE KNOWLEDGE

Use drafting tools
  Identify drafting equipment, Use and operate drafting tools, Lay out a drawing, Make a scale drawing, drawing landscape symbols, Key a drawing, Letter a drawing
Include living or service area
Determine function (color, cutting value, psychological)
Select effect desired
Select shape of planting to conform with other landscaping
Match individual perennial requirements of shade, sun, water to individual conditions
In border plantings, be certain tallest plants are in back, medium, heights in center, small plants at front
Avoid beds in the middle of lawns
Select plants so that a succession of bloom is produced and that all plants at bloom at same time provide harmonious color combinations
Design for easy maintenance since this planting is essentially permanent

SAFETY – HAZARD

SCIENCE

Color harmony
Psychological effects of color
Value of color in changing perspective
Full sun—best colors are livid, warm, strong colors
Full, partial shade—best colors are light, pastel colors
Principles of design
  Repetition
  Accent, or focal point
  Symmetry
  Harmony
  Balance
  Scale
  Rythm
  Unity
Elements of design
  Line
  Form
  Pattern
  Texture
  Color
  Odor
  Space

MATH – NUMBER SYSTEMS

Ratio and proportion
  [Proportion of masses of color to one another, to size of planting bed, and proportions of planting bed to overall planting]

COMMUNICATIONS

Read: Garden catalogs, observe plantings and pictures of plantings and repeat basic designs with appropriate perennials

(TASK STATEMENT) DESIGN A ROCK GARDEN

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting equipment Scale drawing Wayside Garden Catalog Garden magazines	Use drafting tools Identify drafting equipment Use and operate drafting tools Lay out a drawing Make a scale drawing Drawing landscape symbols Key a drawing Letter a drawing Select or develop appropriate site Maintain informality in design Provide for continuous interest in garden, planning bloom or color changes throughout growing season and dormant season Consider shrubs with unusual form, unique leaves, colored stems, ornamental fruits, dwarfed forms of trees and shrubs Determine source and type of rocks to be used	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Color harmony Psychological effects of color Value of color in changing perspective Full sun–best colors are livid, warm, strong colors Full, partial shade–best colors are light, pastel colors Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of masses of color to one another, to size of planting bed, and proportions of planting bed to overall planting]	View: Pictures of rock gardens Read: Garden catalogs and magazines

(TASK STATEMENT) DESIGN FOR SPECIAL NEEDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting equipment Scale drawing List of customer's needs Nelson's "Landscaping the Home Grounds"	Swimming pools: Provide sha[illegible] that conforms to landscape Find source and price of contractor Gazebo or summer house: Use picture of structure which fits into landscape developed Reflection pool: Find source and price of pool bases, use picture to present to customer a design which conforms to landscape style Grape arbor or hobby area: Design for living or service area Grape arbor may serve double purpose Barbeque pit: Design with materials which complement house and/or patio construction materials Design for maximum use Patio: Design with materials which complement facing materials in house, and shape which fits into overall landscape design	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Principles of design Repetition Accent, or focal point Symmetry Harmony Balance Scale Rhythm Unity Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Proportion of special feature to other structures within landscape]	Read: Section in Nelson's book Privacy, swimming pools, patios for entertaining, etc.

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(TASK STATEMENT) SELECT APPROPRIATE PLANTS FOR DESIGN

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
List of locally available plants Estimate of cost to customer Nelson's "Landscaping the Home Grounds"	Describe characteristics of each plant; list advantages and disadvantages of each ground cover; label each plant as per reference material Select trees by shade tree or ornamental classification, height, or flowering characteristics; describe leaves, growth habits, and characteristics of plants; match plants with pictures and descriptions in reference materials; label trees Select shrubs by shade or ornamental classification, height, or flowering characteristics; describe leaves, growth habits, and characteristics of plants; match plants with pictures and descriptions in reference materials; label shrubs	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Elements of design Line Form Pattern Texture Color Odor Space	Ratio and proportion [Select plants with small leaves if the plant must fit in a small or enclosed space and with large leaves for wide, open spaces]	Read: Back sections of Nelson's book Lists of ground covers, ornamental trees, shade trees, vines, shrubs, etc.

Duty II Installing Fences

1 Lay out a fence site
2 Operate post hole diggers
3 Set corner and line posts
4 Construct specific types of fences
5 Clean work area and tools

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(TASK STATEMENT) LAY OUT A FENCE SITE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Landscape drawing Landscape site Chalk line Stakes Robert Lee Bekme Hawthorne Books, Inc., New York "How-to-Build-It"	For geometric fences, lay out lines of fences with chalk line and stakes; for free form fences use flexable garden hose to lay out edge and mark further with spade Use various types of equipment and select proper equipment for the job Maintain clean and neat conditions as work progresses	Wear gloves Splinters

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
		Read: Landscape drawings

(TASK STATEMENT) OPERATE POST HOLE DIGGERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hand post-hole diggers PTO-mounted post-hole diggers Ground area Tarp	Select equipment appropriate for size of job Operate use, clean and maintain hand post-hole diggers Maintain cleanliness on job by placing soil removed from hole on tarp Operate use, clean and maintain PTO-mounted digger	Gloves Blisters from using hand post-hole diggers Tractor safety Injury to operator and to helpers
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Post-hole diggers combination of simple machines]	Linear measurement [Diameter and depth of hole to be dug]	Read: Site stakes to locate hole placement

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(TASK STATEMENT) SET CORNER AND LINE POSTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Corner posts Line posts Supports Tamper Preservative Hole Shovel Bekme "How-to-Build-It" Sledge Saw	Plumb post and space Select method of anchoring Select treated posts or use preservatives Backfill and tamp backfill	Gloves Blisters, bruises, splinters
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Linear measurement [Spacing of posts] Concept of verticle	

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(TASK STATEMENT) CONSTRUCT SPECIFIC TYPES OF FENCES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Common types of fences Hand tools Paint Preservative Bekme "How-to-Build-It" Manufacturer's directions	Plumb post and space Select method of anchoring Select treated posts or use preservative Backfill and tamp backfill Follow manufacturer's directions and recommendations Maintain clean and neat work site	Gloves Blisters Safety glasses Working with metal fences which might puncture hands Hard hats Bumps on head by large fence sections Protective clothing Heavy or hard toed shoes Clean-up area upon completion
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Linear measurement Length of posts, rails, height of fence, etc.	Read: Construction specifications in blueprints Specific fence construction instructions Manufacturer's directions

(TASK STATEMENT) CLEAN WORK AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Rake Wheelbarrow Tarp Shovel Truck	Shovel large debris from lawn and bed area Break up large clods and spread soil evenly on unmulched bed Firm soil Remove excess soil from bed and lawn and place on truck Use stiff push broom to sweep fine soil from grassed area Remove debris from paved areas	Protective clothing Splinters, blisters, cuts
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Cleaning emphasizes neat appearance and improvement in landscape brought about by performing the edging operation	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	

Duty JJ Installing Walls, Planters, and Benches

1 Lay a railroad tie wall
2 Lay block or brick walls
3 Construct a garden bench seat
4 Construct planters
5 Clean work area and tools

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(TASK STATEMENT) LAY A RAILROAD TIE WALL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Railroad ties All-thread and nuts to fit Chain saw Drill and wood bit Large nails Sledge hammers Gravel Shovel Bekme "How-to-Build-It"	Locate site of wall and lay out with chalkline and stakes Dig six to eight inches deep and lay foundation form Follow specifications to determine if pockets or staggering is required If not aligned vertically, dead-man every two to three rows Drive one-half inch cell-thread through three-eighth inch hole which has been chilled through the ends of ties	Gloves Splinters, cuts, blisters Safety glasses Splinters Use grounded drill Electric shock Steel-toed shoes Mashed feet by dropping railroad ties
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines	Addition and subtraction of whole numbers; Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Count number of railroad ties needed for wall]	Read: Blueprint to determine height, length, and direction of wall

(TASK STATEMENT) LAY BLOCK OR BRICK WALLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Blocks Bricks Mixed cement Trowels Chalk line Shovel Bekme "How-to-Build-It" Pipe	Mix mortar (one pint lime, two pints cement, nine pints sand) Clean footing which is poured concrete about eight inches wide and eight inches thick, apply mortar on one brick at a time Check each course with chalkline Insert drainage pipe for seep holes as wall is built	Gloves Abrasions
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers; Locate by approximation rational numbers and integers on the number line (sequential ordering) [Account for number of blocks or bricks needed in wall] Ratio and proportion [Mixing of concrete in proper proportion]	Read: Blueprint to determine length, height and direction of wall

(TASK STATEMENT) CONSTRUCT A GARDEN BENCH SEAT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wood Hammer Nails Stain Paint Preservative Saw Square 12' steel tape Bekme "How-to-Build-It"	Read plans and build as required Make certain supports are sturdy and in good scale	Protective clothing Sawdust inhalation, cuts, mashed fingers
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Linear measurement [Length and width of wood used in construction]	Read: Blueprint to determine material, height, length and location of bench seat

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(TASK STATEMENT) CONSTRUCT PLANTERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Carpentry tools Wood Preservative Stain, paint Nails Screws Bekme "How-to-Build-It"	Construct wooden, brick, stone, and concrete planting boxes	Do not inhale preservative fumes of toxic origin Work in well-ventilated area

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Well-maintained tool eases labor]	Addition and subtraction of whole numbers [Estimation of materials needed for job]	Read: Blueprint to determine type of material, size and placement

(TASK STATEMENT) CLEAN WORK AREA AND TOOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hand tools Rake Shovel Wheelbarrow Tarp Foreman's work sheet	Remove mortar, wood scraps and other debris from landscape area Sweep and hose down as needed	Gloves Blisters, splinters

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Fluids under pressure [Water pressure used to clean tools] Effects of friction on work processes and product quality [Friction used to remove dirt, oil relieves some friction in moving parts] Oxidation of metals reduced by painting Clean equipment helps maintain operating condition, presents a favorable image to customer and helps instill pride in quality of work of crew	Counting [Inventorying tools to be certain no tools are left on site] Measure of time and speed [Time required to do job]	Record: Time needed to do job

Duty KK Transacting Sales

1 Approach the customer
2 Evaluate customer needs
3 Meet customer needs
4 Use suggestion selling
5 Overcome sales resistance
6 Write a sales slip
7 Operate a cash register
8 Operate a credit card machine
9 Use the telephone

(TASK STATEMENT) APPROACH THE CUSTOMER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Customer	Decide how to greet the customer Select appropriate dress for the type of work Use customer name if possible and/or give some indication of previous notice given in the store	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Human relations		Speak: Convey a good impression to the customer Smile, dress neatly and appropriately, treat customer as guest

(TASK STATEMENT) EVALUATE CUSTOMER NEEDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Customer Samples of material to be sold	Ask questions Listen to customer Gather facts Offer suggestions Evaluate customer needs Apply the "need interpretation" to develop sales approach	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Knowledge of money system	Speak: Inductive reasoning Command of vocabulary associated with goods or services sold .

(TASK STATEMENT) MEET CUSTOMER NEEDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Landscape products and services Customer	Secure customer attention and interest Demonstrate merchandise Know products, and services Have customer see and handle material when possible	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Product knowledge	Addition and subtraction of whole numbers [Estimation of total cost of goods and services desired by customer]	Demonstrate: Product Speak: About product or service

(TASK STATEMENT) USE SUGGESTION SELLING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Customer	Know items related in function to items already accepted by customer (ex: customer buys rose, suggest rose fertilizer) Know customer's needs and environment Evaluate customer's "mood to buy"	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Product knowledge		Persuasion: Developing a need to buy article or service

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(TASK STATEMENT) OVERCOME SALES RESISTANCE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Customer	Answer questions Describe services Offer suggestions Ask questions Describe products and their uses Develop a need for the product or service	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Verbal ability: Persuasion, diction, vocabulary

(TASK STATEMENT) WRITE A SALES SLIP

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sales slips Pencil Material purchased and prices Customer	Enter the following on sales slip Date Salesperson Name and address of customer Quantity of item purchased Description of item purchased Price per unit Subtotal Sales tax Total sale Customer signature Give customer copy and retain copy	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers [Addition of items sold] Multiplication and division of whole numbers [Figure sales tax]	Read: Price tags Legibility of writing

(TASK STATEMENT) OPERATE A CASH REGISTER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Cash register Money Customer	Recognize parts and uses of register keys Make change Handle money Change rates tax	

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
	Addition and subtraction of whole numbers [Total, subtotal] Read and interpret tables, charts, and/or graphs [Sales tax tables]	Read: Price tags

(TASK STATEMENT) OPERATE A CREDIT CARD MACHINE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Credit card Credit card machine Customer	Offer credit services Obtain credit card Fill out credit card slip Place credit card in machine Operate machine duplicating mechanism Have customer sign credit card slip Give customer copy of slip and retain one for office records	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers [Totaling, subtotaling] Read and interpret charts, tables, and/or graphs [Charging sales tax]	Write: Necessary information on slip, legibility Read: Price tags

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(TASK STATEMENT) USE THE TELEPHONE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Customer Sales slips Price lists List of services offered Telephone and directory	Receive sales order over telephone Dictate information over telephone Solicit business over telephone Use telephone directory	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Measures of time and speed Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical and literal [Use telephone book and dialing procedure properly]	Speak: Use good telephone manners (e.g., poise, clarity of speech, persuasion) Read: White and yellow pages of telephone directory

Duty LL Handling and Caring for Plants

1 Lift plant materials
2 Hold plant materials in the nursery
3 Label plants and display plants
4 Tie up and protect plants during delivery
5 Load and unload plants for delivery
6 Move plants to planting site from delivery truck

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(TASK STATEMENT) LIFT PLANT MATERIALS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Ball and burlapped stock of various sizes Container stock Bareroot stock Forklift Tractor, lift and chain Truck mounted lift	Determine correct way to lift plant material Lift ball and burlapped stock by various methods according to size of plant Avoid lifting by trunk or top Lift container and bareroot stock by various methods Clean and store equipment	Use machinery to lift heavy plant materials Back injury Heavy shoes Dropping heavy objects on feet Tractor safety and forklift safety Injury to operator Make certain chain connections are secure Dropping heavy ball and burlapped stock
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
Simple machines used to gain mechanical advantage; Work input, work output, friction and efficiency in simple machines [Lifting made easier by simple machines]		Verbal. Commands between persons working together

(TASK STATEMENT) HOLD PLANT MATERIALS IN THE NURSERY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Ball and burlapped stock Sawdust Sprinklers Hose Water Container stock Bareroot stock Annuals and perennials Pesticides Sprayer	Heel in bareroot stock Mulch ball and burlap stock Determine water needs and watering as necessary Spray with pesticides as needed	Avoid lifting heavy loads without aid of machinery Back injury

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
Plant use and need for water	Measure of time and speed [Time and speed of penetration of water into soil] Ratio and proportion [To figure amount of pesticide needed, dilution of solution] Addition and subtraction of whole numbers; Changing percents to fractions and fractions to percents [Basic arithmetic skills] Measures of length; Measure of time and speed [Determination of area and time over which calibration is to occur] Measures of weight; Liquid and dry measures; Measure with the Metric and English system and convert between them [Determination of amount of pesticide solution dispensed]	

(TASK STATEMENT) LABEL PLANTS AND DISPLAY PLANTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Plant labels Nursery marking pen Common nursery stock Price list of plants Yard stick Calipers 10' steel tape Sales display area	Measure height of upright shrubs and spread of spreading plants with yard stick Write label with name and standard size of plant (12-15", 15-18", 18-24", 2-2½', 2½-3', etc.) Measure caliper of trees greater than ten feet (6" above ball) and height of trees less than 10' Label each plant with name and standard size (4-6', 6-8', 8-10') Group plant by growth characteristics (evergreens, shrubs, flowering shrubs, etc.) and by variety within the groups Further divide into size classifications	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring in other than linear, square, and cubic) [Calipers] Measures of length [Height and spread of plants]	Read and write: Signs indicating identity and characteristics of plants

(TASK STATEMENT) TIE UP AND PROTECT PLANTS DURING DELIVERY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Twine Anti-dessicant Plastic netting Tarp Burlap, pinning nails, knife	Use twine to tie up shrubs and trees Use knots to tie twine to trunk Bend limbs upward and toward trunk and wind the twine around tree crown to hold branches in place Tie end of twine so that knot will hold Be aware of meaning of digging tag Use different colors for each day's digging Use plastic wrap or netting to protect plants during delivery Use burlap and pinning nails to protect plants Use anti-dessicants Determine degree of coverage–top and bottom of leaves and stems Method of application–spraying aerosol can, dipping, using hand sprayer	Use sharp knife and wear gloves Cuts to hands Red flag–use on plant materials which extend out of truck bed

SCIENCE	MATH – NUMBER SYSTEMS	COMMUNICATIONS
		Read: Label on anti-dessicnat

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(TASK STATEMENT) LOAD AND UNLOAD PLANTS FOR DELIVERY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Truck-mounted lift Wooden planks Tractor, lift and chain Nursery stock	Select method needed to load plants based on their size and the quantity Anticipate equipment needed for unloading and send with delivery truck Select method of unloading based on size and quantity and conditions on site	Avoid lifting heavy loads without aid of machinery Back injury Roll heavy trees Back injury Make sure chain connections are secure Dropping of heavy ball and burlapped stock
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Read Delivery directions and orders so that correct plant is delivered to correct place

(TASK STATEMENT) MOVE PLANTS TO PLANTING SITE FROM DELIVERY TRUCK

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Nursery cart (two wheeled) Large ball and burlapped stock Wooden planks	Select method of moving plant based on its size and ground conditions Roll plant to hole with one person supporting and protecting top Place plant on cart if ground is solid and move Use tractor and chain if plant is very large, and lower plant into hole Remove chain In other methods roll and gently drop plant into hole	Avoid lifting heavy loads Back injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
		Speak: Verbal commands to co-workers

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Duty MM Inventorying Landscaping Materials

1 Take initial inventory
2 Receive and record inventory
3 Price inventory
4 Take final inventory
5 Maintain inventory

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(TASK STATEMENT) TAKE INITIAL INVENTORY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Inventory stock Inventory cards Pencil	Distinguish between items which are for sale and those which are strictly for use by landscape personnel Divide cards into at least two sets, and make a card for each type of item, listing name, quanitity and condition	Safety shoes Dropping heavy objects on feet
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers; Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance and significant digits (Measuring in other than linear, square, and cubic) [Counting groups and multiply by number of individuals per group] Development of graphs comparing two complimentary sets of figures [Account sheet of plants–how many of each size]	Write Inventory cards involving identification of tools, noting number of like tools, and making note of tool conditions

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(TASK STATEMENT) RECEIVE AND RECORD INVENTORY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Inventory card Pencil Purchase order copy Nursery stock Delivery personnel	As new items are received, check quantity received against quantity ordered Make up inventory card for each type of nursery stock received listing quantity, size, condition and source	Avoid lifting heavy loads by hands–use machinery Back injury
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers. Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance and significant digits (Measuring in other than linear, square, and cubic) [Counting groups and multipy by number of individuals per group] Development of graphs comparing two complimentary sets of figures [Account sheet of plants–how many of each size]	Read: Purchase orders Delivery slip Discuss: Delivery and discrepencies with trucker Write: Note damaged condition of inventory Notify company from whom purchased if stock is missing or in poor condition

(TASK STATEMENT) PRICE INVENTORY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Wholesale price lists Retail price lists Pencil Paper	Consult wholesale price list and roughly double price to obtain retail price Label items with prices Determine pricing according to demand, type of clients, geographic areas	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Multiplication and division with whole numbers (Roughly double wholesale price to obtain retail price)	Read: Wholesale price list "Suggested retail price list" Retail price lists of competing outlets

(TASK STATEMENT) TAKE FINAL INVENTORY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Initial inventory cards Sales records Final inventory items Pencil	Count materials in stock Count materials sold Add above two figures and compare with inventory cards	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Addition and subtraction of whole numbers; Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance and significant digits (Measure in other than linear, square, and cubic) [Counting groups and multiply by number of individuals per group] Development of graphs comparing two complimentary sets of figures [Account sheet of plants–how many of each size]	Read: Initial inventory cards Write: Kind and number of items missing from set of initial inventory cards Read: Sales records to determine what has been sold versus total inventory missing since initial inventory

(TASK STATEMENT) MAINTAIN INVENTORY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Inventory cards Sales records Catalogs Order forms Pencil	Use inventory cards determine what items are selling well Consult inventory cards to find a source and condition of stock previously ordered If condition was good, check current price lists and re-order if price is acceptable	
SCIENCE	**MATH – NUMBER SYSTEMS**	**COMMUNICATIONS**
	Development of graphs comparing two complimentary sets of figures [Write up purchase order requesting specific quantity of a specific size]	Read: Sales records to determine rate of sales of materials Catalogs and write up order forms Inventory cards to note amount of material stocked

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	DUTY STATEMENTS	Nursery Worker	Landscape Planter	Maintainance Worker	Landscape Designer Consultant
A	Mowing lawns	1	2	4	2
B	Fertilizing landscape plants	4	2	4	3
C	Pruning landscape plants	4	2	4	3
D	Watering landscape plants of various types	2	2	4	3
E	Mulching landscape plants	2	4	4	3
F	Edging of landscape beds	1	4	4	3
G	Removing leaves from landscape and plantings	1	2	4	2
H	Maintaining small engines and equipment	4	4	4	2
I	Renovation of lawns	1	2	4	2
J	Balling & burlapping trees & shrubs	4	3	3	2
K	Wrapping, guying, stacking trees	2	4	3	3
L	Preventing winter damage in landscape plantings	2	2	4	3
M	Maintaining hand tools	4	4	4	2
N	Caring for wounds in woody plant materials	3	3	4	2
O	Controlling disease in landscape plantings	3	3	4	2
P	Controlling weeds in landscape plantings	3	4	4	2
Q	Controlling insects in landscape plantings	3	3	4	2
R	Preparing a planting bed	1	4	3	3
S	Establishing lawns	1	4	2	3
T	Applying fertilizer and lime	4	4	4	3
U	Planting hedges and screens	1	4	3	3

V	Planting ground covers	1	4	3	3
W	Planting trees	2	4	3	3
X	Planting shrubs	2	4	3	3
Y	Applying herbicides	4	4	4	2
Z	Applying anti-dessicants	4	4	2	2
AA	Installing edging	1	4	2	3
BB	Laying sod	1	4	2	3
CC	Planting perennials & annuals	1	2	4	3
DD	Applying water to landscape plantings	3	3	4	3
EE	Using drafting tools	1	2	2	4
FF	Calling on the customer	1	4	4	4
GG	Estimating costs of landscaping & pricing	1	3	4	4
HH	Designing a landscape	1	2	2	4
II	Installing fences	1	4	2	3
JJ	Installing walls, planters and benches	1	4	2	3
KK	Transacting sales	1	2	3	4
LL	Handling and care of plants	4	4	2	3
MM	Inventorying landscape materials	1	2	2	4

4 - Ability to perform tasks within duty
3 - Working knowledge of tasks
2 - Some awareness of tasks
1 - No knowledge fo tasks needed